Nash

TECHNICAL MANUAL

For the

FOLLOWING MODELS

★

41-42-46-47-48

OF THE 40 SERIES

★

41-42-46-47-48

OF THE 60 SERIES

★

41-42

OF THE 80 SERIES

★

Nash Motors

DIVISION OF NASH-KELVINATOR CORP.

DETROIT, MICHIGAN, U.S.A.

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ENGINE SECTION

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TECHNICAL MANUAL

DESCRIPTION 2

REMOVAL AND INSTALLATION OF THE ENGINE 2

CYLINDER HEAD 2

VALVES AND VALVE TIMING 3

CAMSHAFT AND BEARINGS 5

CONNECTING ROD AND PISTON ASSEMBLY 5

CRANKSHAFT AND MAIN BEARINGS 8

FLYWHEEL 12

OIL SYSTEM 12

VIBRATION DAMPENER 15

ENGINE MOUNTINGS 15

ENGINE SPECIFICATIONS 17-25

MAY 1, 1948

ENGINE SECTION
NASH TECHNICAL MANUAL

DESCRIPTION

41-42-46-47-4840 Series

This engine is a 6-cylinder, L-head type, equipped with replaceable camshaft, crankshaft and connecting rod bearings. Full force-feed lubrication system delivers oil to all bearings. The pistons, pins, cylinder walls and the valve mechanism are lubricated by oil spray from the rod bearings. Uniform cooling is provided in the cylinder block by means of a thermostat mounted in the outlet tube from the engine.

41-42-46-47-4860 Series

This is a 6-cylinder, valve-in-head engine, equipped with replaceable camshaft, crankshaft, and connecting rod bearings. All bearings, piston pins and valve tappets are lubricated under pressure through a system of drilled passages in the crankshaft and cylinder block. Complete oil circulation under pressure reduces friction and wear, as all moving parts are cushioned on a film of oil. For efficient operating temperatures a thermostat is placed between the cylinder head and the radiator tank.

41-4280 Series

This is an 8-cylinder valve-in-head engine that incorporates all of the features of the 60 series engine.

REMOVAL AND INSTALLATION OF THE ENGINE

To remove an engine from the car, remove the hood, and remove radiator and hose connections from the engine. Disconnect the fuel lines at the fuel pump, and the exhaust pipe at the manifold flange. Then disconnect the throttle controls and remove the linkage from the engine. 4140-60-80 Series. Disconnect the oil gauge line at the flexible tube and the heat indicator tube and bulb from the cylinder head, 4240-60-80, 46-47-4840-60. Remove telegage connections. Remove the high and low tension wires from the ignition coil and the wires from the generator. Remove the crankcase ventilator and the front and rear engine support bolts.

From under the car disconnect the clutch pedal linkage and the transmission from the clutch housing. Use care in lifting the engine from the car so as not to damage the engine accessories.

Installation

Care should be taken when replacing an engine to use all new gaskets and cotter keys.

CYLINDER HEAD AND GASKET

Whenever a cylinder head is removed, inspect the studs to make sure that they are tight in the block. Use a sealing compound around the studs to seal them before the head is replaced. If studs are removed, they should be sealed with compound before replacement.

If it is necessary to remove the studs to clean the top surface of the block, always chamfer the tapped holes 1/16″ wide so that any metal that might be pulled up when tightening the head will not interfere with the head gasket seating.

Make sure that the top surface of the block and the under surface of head are CLEAN—FLAT—and SMOOTH. Always use a new gasket.

Coat the gasket with a very light coating of PERFECT SEAL GASKET PASTE to insure a tight seal between the head and the block.

Installing the Cylinder Head

Care should be taken not to damage the cylinder head gasket as it is placed over the studs. Locate the gasket and slide it over the studs evenly. Replace the head and draw the stud nuts down in a uniform manner using a torque wrench as shown. (Figure 1.)

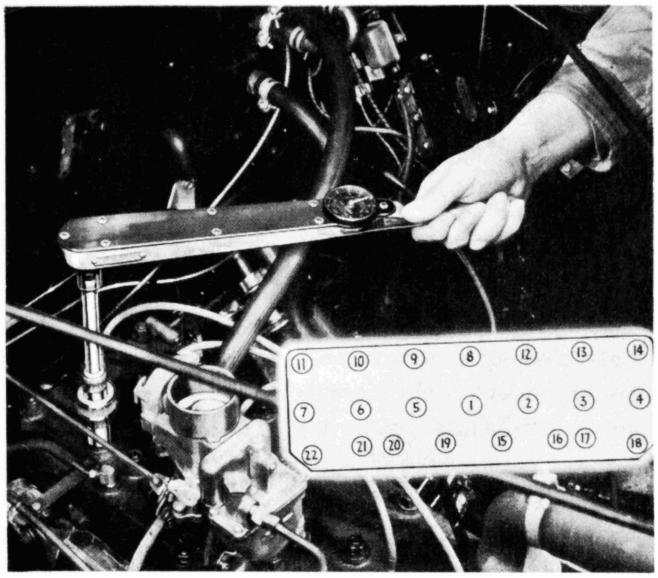


Figure 1 — Cylinder Head Tightening Sequence 41-42-46-47-4840 Series Engines.

Cylinder heads that are unevenly tightened will warp and cause gasket failure, or they may cause cylinder bore distortion resulting in blow-by piston failures. Follow the tightening sequence as shown. (Figure 2.) The torque specifications will be found in the Engine Specifications Section, Pages 19, 22, 25.

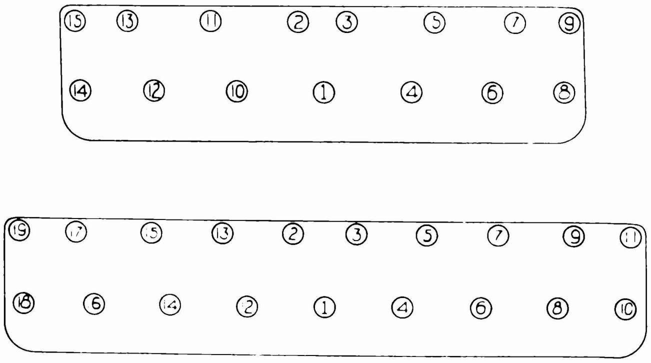


Figure 2—(A) Cylinder Head Tightening Sequence for 41-42-46-47-4860 Series Engines. (B) 41-4280 Series Engines.

Eight Cylinder Engine Cylinder Heads

38-39-40-4180 Series cylinder heads are not available. Substitute the cylinder head and gasket used on the 4280. In order to retain the original angular movement of the push rods use washer **WA-1035** below each rocker arm shaft stud spacer.

Six Cylinder Engine Cylinder Heads

Service Assembly Part 3123400-A which is the 4760 cylinder head with attaching parts is now used on 38-39-4020 series engines.

Service Part number 3111950 with Part Number 3123400-A which includes the 4760 cylinder head is used on 1220 and 3720 series engines.

VALVES AND VALVE TIMING

Valve Springs

Whenever valve springs are removed, they should be checked according to the specifications on pages 18, 21, 24. If not within the limits they should be replaced.

41-42-46-47-4840 Series

When installing the valve springs, the closely coiled ends must be at the top and against the cylinder block. If reversed a spring vibration may develop that will affect valve operation.

> CAUTION: *Make sure that the springs are seated in the counterbore of the valve tappet compartment, otherwise excessive wear will result on the valve stems and valve guides.*

Removal or Replacement of Valve Tappets — All Series

To remove the valve tappets on all series engines it is necessary to remove the camshaft so that the valve tappets can be removed from the bottom.

41-42-46-47-4840 Series

The camshaft can be removed without removing the valves or cylinder head by using Tool (J-1612) as shown. (Figure 3.) Valve holding clips are used to hold the valve tappets up as the camshaft is removed.

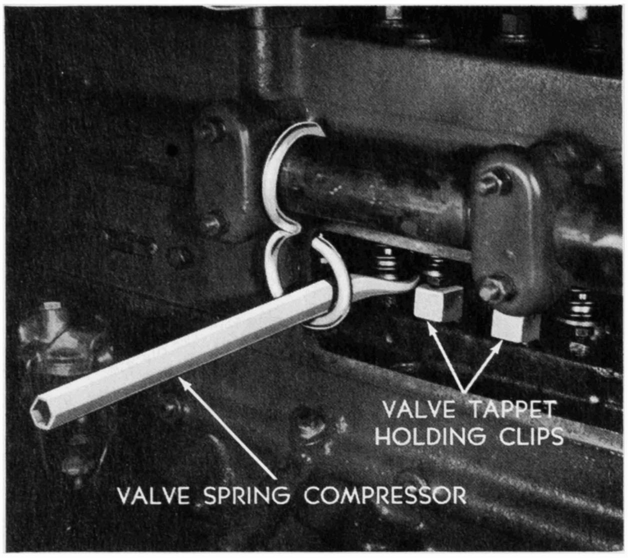


Figure 3—Valve Tappet Tool and Holding Clip J-1612.

41-4260-80, 46-47-4860 Series

On these overhead valve engines, the camshaft is removed by first removing the push rods. Then remove the valve plate and snap a rubber band around the valve tappets. This holds them up so that the camshaft can be removed.

Valve Tappet Clearance

Valve tappet clearance is adjusted on 41-42-46-47-4840 series by removing the cover plate on the right side of the engine block. On 41-4260-80, 46-47-4860 series, the valves are adjusted by removing the valve cover on top of the cylinder head.

Refer to Engine Specifications on pages 18, 21, 24 for the recommended clearances to be used in adjusting valves.

Valve Stem to Guide Clearance

Valves which stick in the guides are usually the result of gum, carbon or varnish accumulation on the valve stem. Overheating of the valve due to lack of sufficient clearance in the guide is also a factor. Never ream the valve guide beyond the allowable clearance as specified on pages 18, 21, 24. Inspect the distance from the top of the valve guide to the gasket surface of the head or block. A valve guide that extends into the valve port too far will overheat and cause a valve to stick. The recommended limits for valve guide height will be found on pages 18, 21, 24.

Valve Tappets

The valve tappets used on 41-42-46-47-4840 series engines require the use of only two wrenches to make the adjustment as the adjusting screw is locked into position by the thread in the tappet and the thread in the bushing being out of index with each other. The bushing is welded to the top of the tappet. It is recommended that this part always be replaced as an assembly although the adjusting screw is supplied as a separate part. This adjusting screw should have a resistance of 50-inch pounds through its adjustment range in order to maintain the proper tappet adjustment.

Valve Timing

Valve timing is determined by the relation between the sprocket on the camshaft and the sprocket on the crankshaft. (Figure 4.)

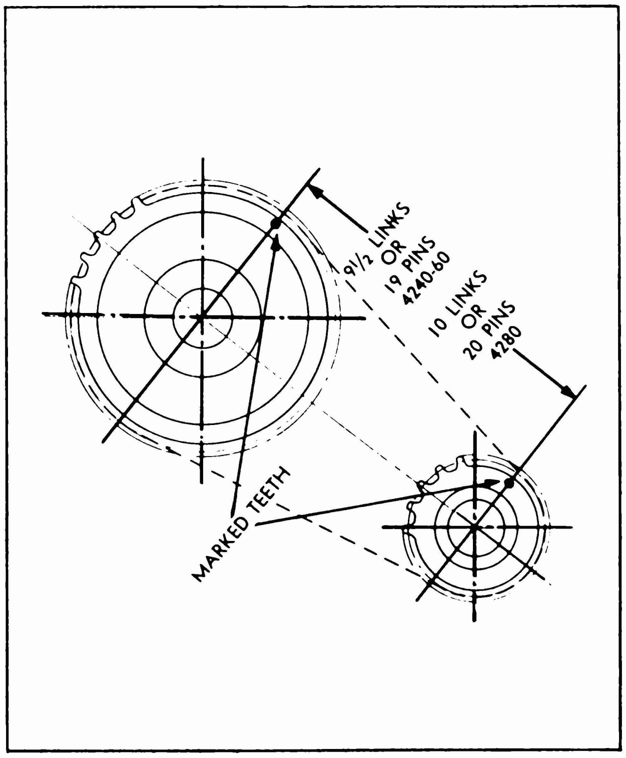


Figure 4—Correct Relation of the Camshaft Sprocket and Crankshaft Sprocket for Valve Timing.

Before installing the timing chain cover, inspect for correct installation of the timing chain. Locate the marked tooth of the camshaft sprocket at approximately one o'clock position and the marked tooth of the crankshaft sprocket at a point where the marked tooth just begins to mesh with the chain. (Figure 4.) Count the number of links between the two marked teeth of both sprockets. This should be 9½ links, or 19 pins. Each link consists of two pins.

41-4280 Series

The number of links should be 10 links or 20 pins. Valve timing may also be inspected by bringing No. 1 piston into firing position to a point where the indicator on the timing chain cover is in line with the D. C. mark on the front of the crankshaft pulley. Inspect the exhaust valve lash, and set to the specifications for exhaust valve timing listed below. Turn the crankshaft one complete revolution (clockwise), until the indicator again lines up with the D. C. mark. Continue to turn the crankshaft slowly until the exhaust valve just seats. The push rod will just begin to turn freely. Measure from the D. C. mark to a point in line with the indicator. If this distance is approximately the distance specified in the chart below, the valve timing is correct. If the exhaust valve seats before this point, the valve timing is early. If the exhaust valve seats after this point the valve timing is late. In either case the timing chain will have to be reset.

VALVE TIMING CHART

Distance from D. C. mark to a line under indicator.

Series	Set No. 1 Exhaust Valve at	Degrees	Inches
4140	.019″	10°	5/8″
4240	.019″	10°	5/8″
4640	.019″	10°	5/8″
4740	.019″	10°	5/8″
4840	.019″	10°	5/8″
4160	.0225″	6°	3/8″
4260	.0225″	6°	3/8″
Early 4660	.0225″	6°	3/8″
Late 4660	.0225″	16°	1″
4760	.0225″	16°	1″
4860	.0225″	16°	1″
4180	.015″	10°	13/16″
4280	.015″	10°	13/16″

Timing Chain Cover

The timing chain covers on all series cars are provided with a felt seal to prevent the entrance of dirt, or the leakage of oil around the front crankshaft pulley hub. When installing the cover always keep it concentric with the pulley. This can be done by leaving the cover screws loose until the pulley is installed. Then tighten the cover screws.

An oil slinger is used inside the cover. It is held in place by the crankshaft sprocket.

CAMSHAFT AND BEARINGS

Camshaft Bearings

Camshaft bearings are not adjustable, and it is not recommended that these bearings be replaced as experience indicates that they do not need replacement. These bearings are steel shells, babbitt-lined. They are pressed into the engine block and line bored in place, parallel to the main bearing bore. Camshaft bearings are step-bored which means that the front bearing is larger than the rear.

All camshaft bearings are lubricated under pressure through drilled galleries.

Camshaft End Play

The end play of the camshaft is determined by the press fit of the camshaft sprocket on the camshaft. The clearance between the camshaft bearing and the camshaft sprocket should be from .004″ to .006″.

REPLACEMENT OF CONNECTING ROD AND PISTON ASSEMBLY

Connecting Rod Bearings

These bearings have a steel back with a thin babbitt lining and are precision machined so that no fitting is required. These bearings are non-adjustable and come in pairs. Both halves must be replaced at the same time.

Bearing Clearances Using Nash Plastigage

Measuring bearing clearances with Plastigage is very simple. After the bearing cap has been removed and the oil wiped from the crankshaft and bearing shell, a piece of Plastigage is laid across the bearing insert. The bearing cap is reinstalled with a torque-indicating wrench to the torque recommended.

When the bearing cap is tightened, the pressure causes the Plastigage to be flattened. The less clearance there is, the greater the flattening of the Plastigage, and the wider it will be. When the bearing cap is removed, the width of the Plastigage is measured by direct comparison with the graduated scale on the Plastigage envelope. The numbers on the graduated scale indicate bearing clearance in thousandths of an inch.

Crankshaft Pin

Inspect the condition of the crankshaft pin for out-of-round, taper and roughness. Crankshafts should be reworked if more than .002″ out-of-round or tapered. Connecting rod bearings are supplied standard, minus .002″ and minus .010″. The last two are bearings that have more bearing material to compensate for a worn shaft, or one that has been ground undersize.

Connecting Rod Bearing Caps

When removing bearing caps mark them with a center punch to indicate the location of the cap on the rod, as well as the rod in the respective cylinder bore. *Never file bearing caps if the bearing clearance is excessive.*

Connecting Rod Bolt Nut Lock Nut

A pressed steel "Pal" nut is used to retain the connecting rod bolt nut in place.

CAUTION: *Never use this nut on a connecting rod bolt that is drilled for a cotter pin.*

If a "Pal" nut should be used, always use a new one and draw it up tight. Be careful not to over-tighten.

Connecting rod bolt nuts should be tightened with a torque wrench as specified on pages 18, 21, 24.

Oversize Bearings and Undersize Shafts

In the machining of engine blocks and shafts, it is common practice to machine the cylinder bores up to .010″ oversize and the crankshaft connecting rod and main bearings up to .010″ undersize. In engines that are other than standard it is necessary to order pistons, rings, main bearings and connecting rod bearings to fit. These engines are stamped with a three-letter code. In the 40 Series it is stamped on the machined surface near the water temperature gauge. In 60-80 Series it is stamped on the machined surface provided for the engine number, located on the right side in the upper corner just ahead of the oil filter. This code is as follows:

1st letter—Size of Bore

2nd letter—Size of Main Bearings

3rd letter—Size of Connecting Rod Bearings

A—Standard

B—Undersize .010″

C—Oversize .010″

Example: An engine having an oversize .010″ bore, standard main bearings, and undersize .010″ connecting rod bearings will have a code as follows: CAB.

Fitting Pistons

All pistons used are cam ground. This means that the piston is larger across the diameter at right angles to the piston pin hole, although in operation it rounds out in the bore to produce uniform operating clearances.

All pistons are tin plated to prevent scuffing during initial operation, the plating material wearing off and depositing on the walls of the cylinders. When pistons are found to be scored it is usually the result of dirt, or the lack of lubrication.

41-42-46-47-4840-60 Series

An Aluminum Split Skirt piston is used in these engines. They are selected in production for the individual cylinder bore. This piston is fitted in the bore so that it must hold its own weight in the bore approximately 1/3 down from the top of the bore, but still be free enough to be worked by hand.

When pistons are fitted to individual bores by feel, it is important that the piston and the cylinder bore be absolutely clean and free from oil or foreign material.

41-4280 Series

The piston used in the eight cylinder engines is the conventional invar-strut type, which is not affected by temperature changes. The struts act to maintain the piston size at various temperature changes so that a uniform operating clearance of .002″ is maintained. To inspect this clearance use a .0025″ feeler ½″ wide, dry (not oiled). Install the feeler between the piston and the bore opposite the slotted skirt. It should take from 8 to 15 pounds pull on a spring scale to withdraw the feeler.

Piston Pins and Locks

Piston pins are full floating and are positioned in the piston by snap rings, held in grooves at each end of the piston pin.

Fitting Piston Pin — All Series

To fit the piston pin, hone the piston and bushing to the following specifications:

Light thumb push fit in the connecting rod bushing, at room temperature. Palm push fit in a heated piston. (Heat piston in boiling water.)

Use new snap rings for all replacements. Make sure they are seated in the ring groove in the piston.

Cylinder Bores

Cylinders that are not badly scored, but simply need cleaning up, can be reconditioned with a hone.

If the cylinders are badly scored or definitely out-of-round they should be rebored with a reliable boring tool, then honed to polish the cylinder walls. A completed job should show not more than .0005″ out-of-round.

> CAUTION: *Before reconditioning cylinder walls, be sure that the crankshaft, camshaft and all working parts of the engine are covered to prevent cuttings, or abrasives, from getting into the bearings and oil passages. Clean the engine thoroughly after completing the reconditioning operation.*

Fitting Piston Rings

The limits of cylinder out-of-round are .003″. Taper .009″.

Before rings are installed in a piston, the piston should be inspected for excessively worn ring grooves. When making this inspection, use a new top ring and roll it around the piston in the ring groove to see that it is free from any bind. Next, install the top ring and see if a .006″ feeler can be inserted between the top of the ring and the ring land 1/16″ in from the face of the land. If it can the piston should be replaced. This inspection is important as a piston ring must seal against both sides of the grooves. The top ring groove of a piston should always be inspected as it is the groove that is worn the most.

Inspecting Ring Gaps

Before installing rings on a piston the ring gap should be inspected. The rings should be pushed down into the cylinder, to the bottom or unworn part. (Figure 5). Push them down with a piston inverted. This way the rings will be square in the cylinder. Use a feeler gauge to determine the gap clearance, which should be to the specifications found on pages 17, 20, 23.

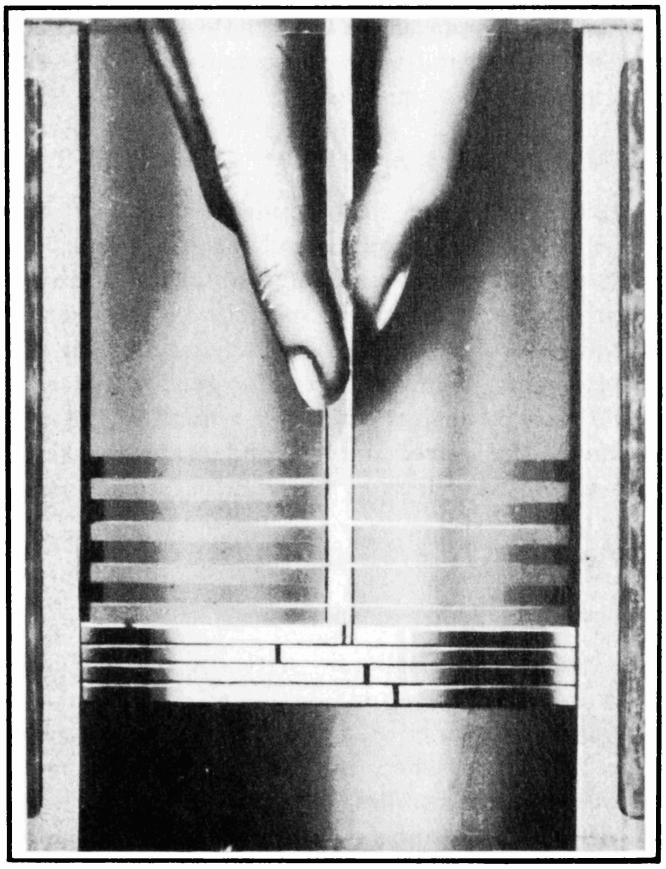


Figure 5—Piston Ring Gap Clearance Check.

Installation of Rings on Pistons

Rings should always be installed with a ring tool. Then inspect the ring clearance by moving the ring so that it is flush with the ring land. It should be possible to insert a .0015″ feeler gauge between the top of the ring and the ring land on all compression rings. Oil rings should be free in the grooves.

Lubricate the Piston Rings Before Installation

Immerse the piston assembly with the rings installed into a heavy engine oil or castor oil. Castor oil is recommended as pre-installation lubricant, as gasoline does not destroy it and engine oil will not flush out castor oil during the break-in period.

Always use a good ring compressor to insert the piston assembly into the cylinder bore.

In assembly, the split skirt of the piston should be installed opposite the squirt hole in the connecting rod, and installed in the cylinder bore so that the split skirt is opposite the thrust in operation.

Cylinder Wall Ring Ridge

Inspect the top of the cylinder bore for a ring ridge. Before the pistons and rings are installed in the cylinders the ring ridge must be removed to prevent breakage of the new rings or damage to the pistons. Use a good ridge reamer and do not under-cut the cylinder. It is also good practice to run a hone through the cylinder a number of times to break the glazed surface and assist the rings to seat. *Always clean cylinder bores after honing.*

CRANKSHAFT AND MAIN BEARINGS

Crankshaft Balance

The crankshaft is balanced statically and dynamically as a complete unit, including the main flywheel, and vibration dampener. Balance holes are drilled in the flywheel front and rear. Care must be taken when installing the flywheel to the hub to see that the timing marks are in line with the hub key and on the same side.

Crankshaft End Thrust—

41-42-46-47-4840 Series

The crankshaft end thrust is taken on the front main bearing as shown. (Figure 6). This end play should be between .006″ to .008″. Refer to Engine Specifications page 18.

The steel thrust plate has a chamfer which must be installed to the rear so that the plate will come up tight against the front main bearing journal. It is important that the other parts be installed as shown in Figure 6, and drawn up tight by the retaining screw.

To prevent the possibility of slight oil leaks at this point, a cork seal is used between the front end of the crankshaft and the pulley hub retainer, in addition to the rubber seal ring.

> CAUTION: *It is important that a special shakeproof lockwasher be used between the pulley hub retainer and the counterbore in the pulley hub. When the retaining screw is drawn up tight against the lockwasher the pulley hub retainer will not creep.*

41-4260-80, 46-47-4860 Series

In these series of engines the crankshaft end thrust is taken by the center main bearing which is flanged for this purpose. Refer to pages 21, 24 for the amount of clearance between the bearing and the crankshaft.

To check this clearance pry the shaft toward the front and check the clearance between the front of the bearing and the shaft. If the clearance is .004″ greater than the limits specified on pages 18, 24, the bearing should be replaced.

Crankshaft Main Bearings

Crankshaft main bearings are of precision type. They have a steel back with a thin babbitt lining.

Bearings are not adjustable. *Shims should never be used,* and the *bearing caps should never be filed.*

When either half of a bearing requires replacement, both halfs should be replaced. To replace the upper half of a bearing, remove the bearing cap of the bearing to be replaced. Then loosen all of the other bearing caps.

Insert in the crankshaft oil hole a small pin, that is about ½″ long. The head of this pin should be large enough so that it will not fall into the oil hole yet thinner than the thickness of the bearing. Bend the head of the pin so that it will lie flat on the shaft when the pin is in place. (Figure 7.) With the pin in place rotate the shaft so that the upper half of the bearing will rotate out in the direction of the locating tongue on the bearing.

New bearing can be installed by reversing the above procedure.

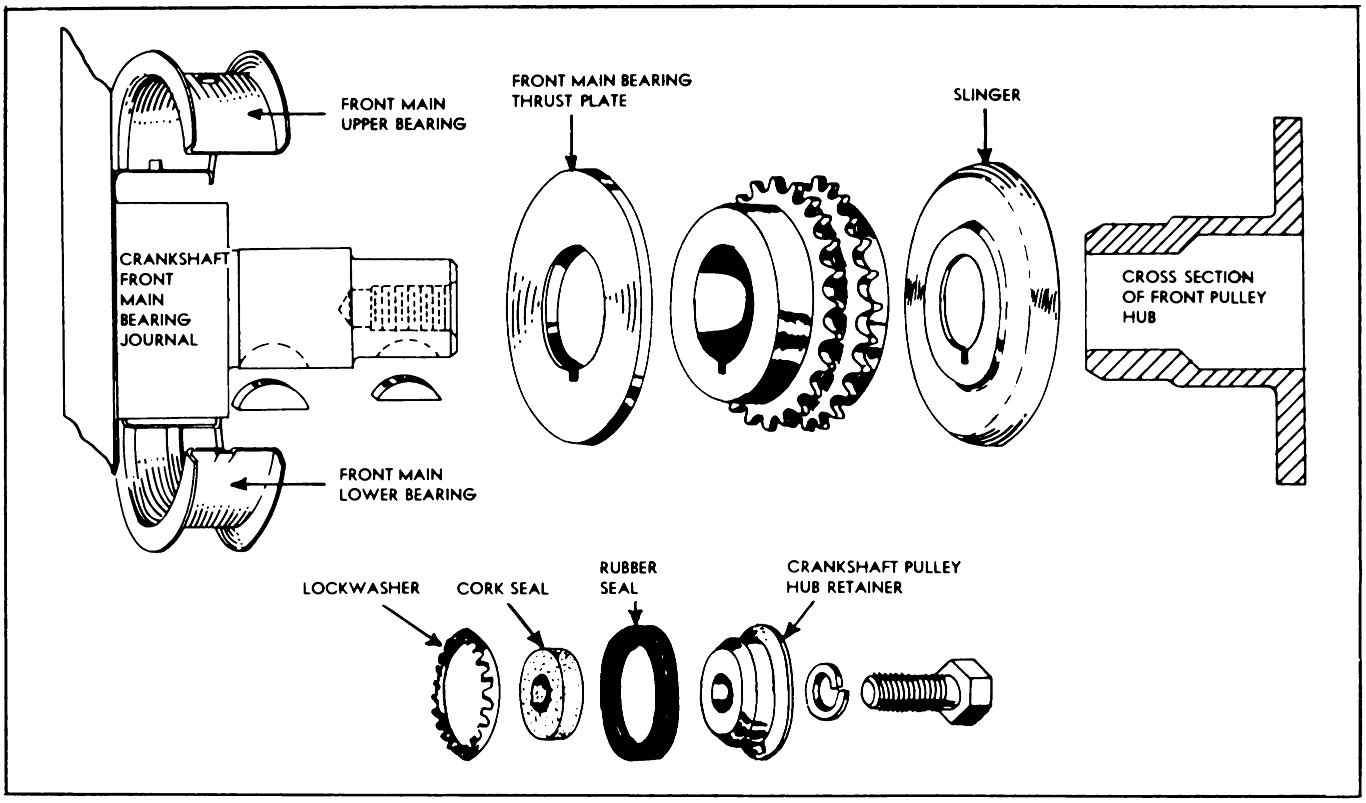

FRONT MAIN UPPER BEARING
FRONT MAIN BEARING THRUST PLATE
SLINGER
CRANKSHAFT FRONT MAIN BEARING JOURNAL
CROSS SECTION OF FRONT PULLEY HUB
FRONT MAIN LOWER BEARING
LOCKWASHER
CORK SEAL
RUBBER SEAL
CRANKSHAFT PULLEY HUB RETAINER

Figure 6—41-42-46-47-4840 Series, Front Main Bearing Crankshaft Thrust and Retaining Parts.

Main Bearings 47-4840-60 Series Starting with Engine No. KE-55001 Serial No. K-196901, 40 Series and Engine No. RE-022227, Serial No. R-459542, 60 Series

Main bearings have been changed to incorporate a 360 degree oil groove. This is to provide better lubrication of the main bearings and cylinder wall lubrication.

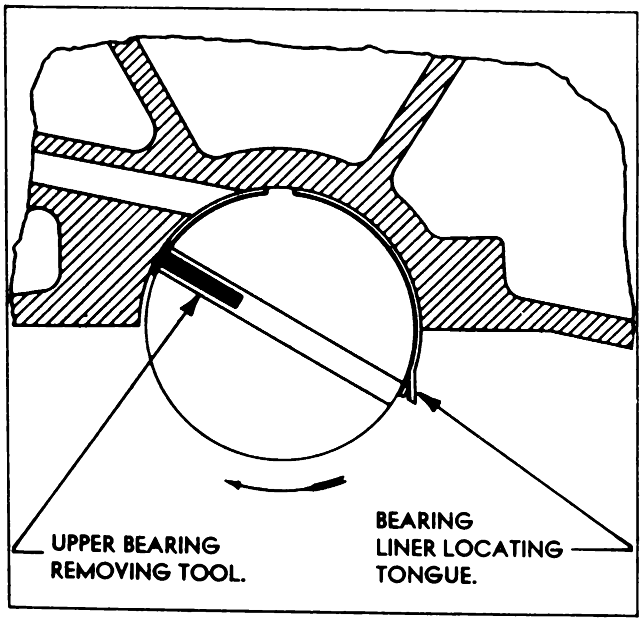

UPPER BEARING REMOVING TOOL.
BEARING LINER LOCATING TONGUE.

Figure 7—Removing Upper Half of Main Bearing.

This bearing is not to be used in engines that do not have the new oil pump referred to on page 12.

Crankshaft Main Bearing Clearances

After determining that the crankshaft is smooth and within the limits of .002″ out-of-round and less than .002″ taper, the clearance of the bearings may be checked as outlined on page 5, Bearing Clearances, using Nash Plastigage.

Undersize Main Bearings

Crankshaft main bearings are furnished in .002″ and .010″ undersize to compensate for wear and shafts that have been ground down. (See page 6, Oversize Bearings and Undersize Shafts.)

Main Bearing Caps

41-42-46-47-4840-60 Series

In these series engines the main bearing caps are recessed into the block. They are line bored in the block, therefore, it is not practical to replace them.

In extreme emergency, where a main bearing cap has been damaged, a new cap may be installed by fitting the cap so that it will line up with the bore. This is done by filing the cap on the side at the point of recess. If this is done, make sure that the alignment is correct. Tighten the main bearing retaining screws, then back them off and rotate the shaft, which will align the bearing cap. Then reset the retaining screws with a torque wrench. See specifications on pages 18, 21, 24.

41-4280 Series

In these series engines the main bearing caps are not recessed in the block, but doweled in place during the boring operation. To replace this cap, the retaining screws should be drawn up tight, then backed off slightly. Rotate the shaft; at the same time use a tapered punch to line up the dowel holes and tighten the retaining screws from 70 to 73 ft. lbs. of torque.

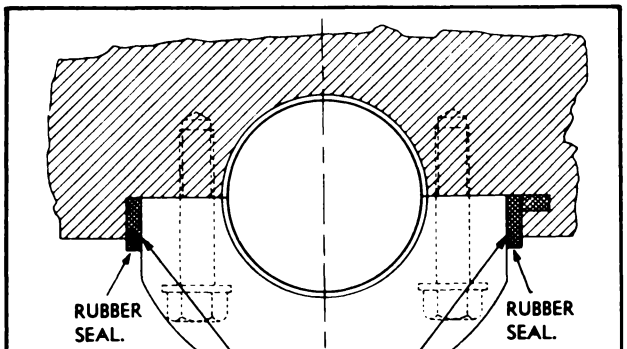


Figure 8—40 Series Rear Main Bearing Oil Seal.

Rear Bearing Oil Seals

To prevent the loss of oil through the rear main bearing, all three series engines have an oil slinger integral with the shaft.

41-42-46-47-4840 Series

This slinger is of simple design. (Figure 8). A packing is installed in the block and cap to the rear of the slinger. This prevents leakage of oil that gets by the oil slinger, and also prevents dust from entering the engine.

The rear main bearing cap on this series of engines is provided with rubber seal plugs to seal the outside edges of the cap against the recess in the block.

NOTE: *This seal has been changed to an angle seal for 4840 Series. Fig. 8.*

When installing the rear main bearing oil seal in the 40 series engines, the crankshaft and bearing have to be removed to replace the upper half. Press the upper half of the oil seal into the groove

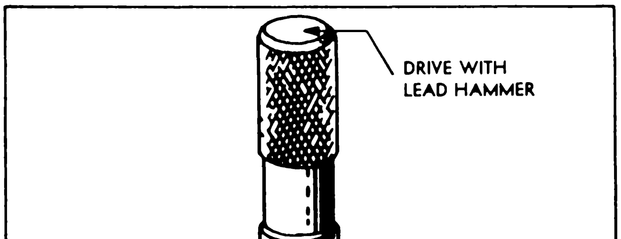


Figure 9—40 Series Oil Seal Packing Installing Tool J-1610.

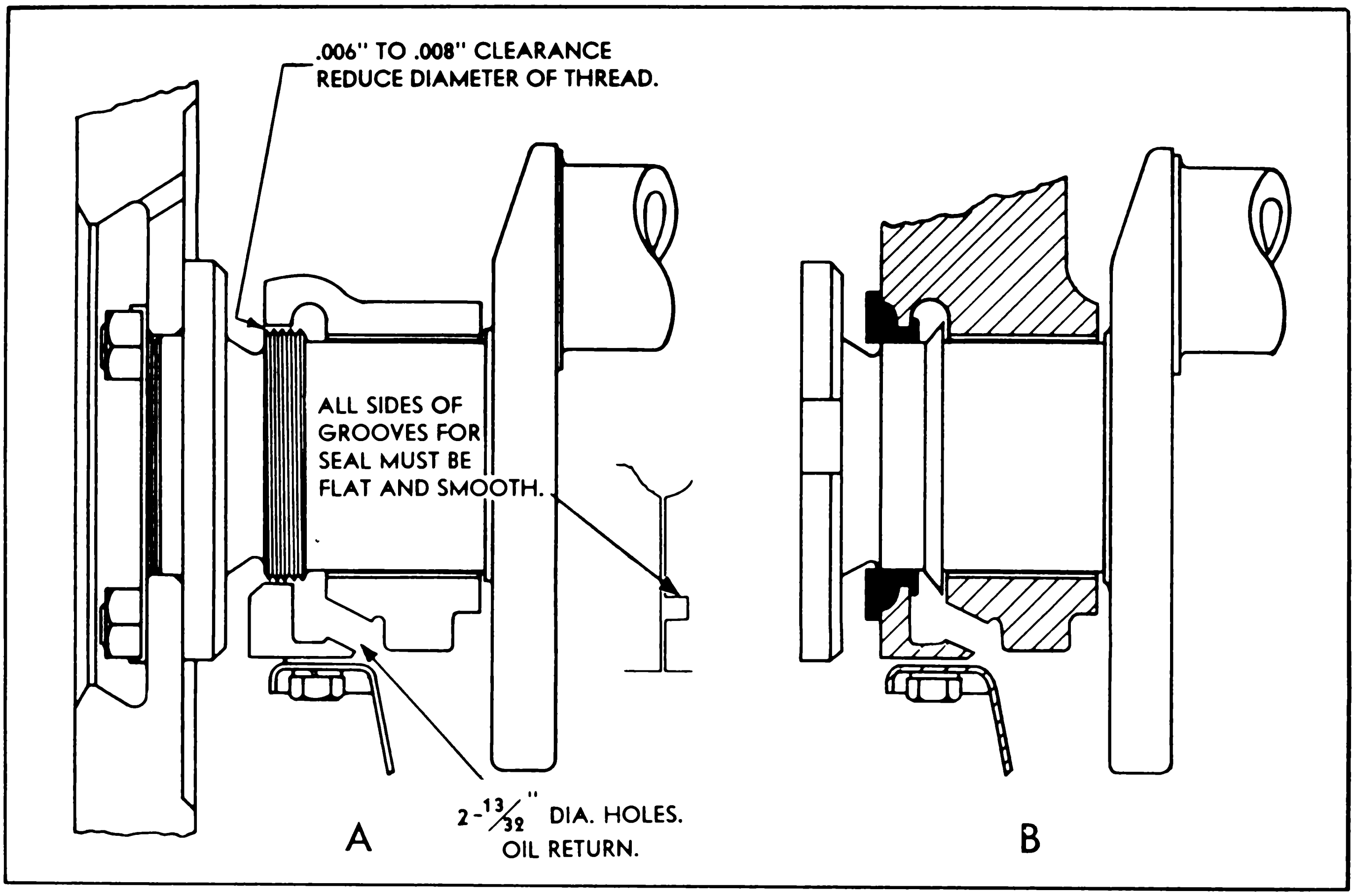

.006" TO .008" CLEARANCE
REDUCE DIAMETER OF THREAD.
ALL SIDES OF GROOVES FOR SEAL MUST BE FLAT AND SMOOTH.
2-13/32" DIA. HOLES.
OIL RETURN.
A
B

Figure 10 (A)—41-42-46-4760 Series Rear Main Bearing Oil Seal.
(B)—4860 Series Rear Main Bearing Oil Seal.

in the engine block and place the installing tool in the block as shown. (Figure 9.) Use Installing Tool (J-1610). Place the tool with large diameter in line with the seal groove. Use a lead hammer to drive the tool and force the packing into position. The large diameter of the tool is designed to compress the standard packing. While still holding the tool firmly in place, cut the ends of the packing off flush with the bearing cap seat. Install the lower half of the packing in the bearing cap in the same way.

41-42-46-4760 Series

The oil slinger used on these engines is a threaded section integral with the crankshaft. This thread rotates in line with a cored groove in the block and cap. Oil holes in the cap return the oil to the oil pan.

In this series of engines .006″ to .008″ clearance must be held between the bore in the cap and the block (Figure 10A). This clearance is checked after the bearing cap has been dropped into place. Use a feeler gauge and make the check in two or three places to insure against an eccentric oil thread.

If the clearance must be increased it should be done by reducing the outside diameter of the thread. Do not alter the bore in the bearing cap.

4860 Series

In this engine the threaded oil return on the rear of the crankshaft has been eliminated and replaced with a steel-backed synthetic rubber seal (Figure 10B). Because of this a new cylinder block, crankshaft, and rear bearing was required. Therefore these parts are not interchangeable with the previous parts except as a complete assembly. The rubber seal is in halves and fits closely over the edge of the rear bearing oil-return groove. It bears firmly on the smooth area of the crankshaft.

The wooden plugs formerly used to seal the sides of the rear bearing cap are replaced by synthetic rubber key strips overlapping the bearing cap and sealing the sides as well as the mating surfaces.

41-4280 Series

This oil slinger is similar to that used on the 40 series engines with the exception that there is no packing at the rear of the oil slinger on the shaft. Clearance must be held between the rear end of the bearing cap and the shaft, the same as that of the 60 series engines. This clearance is .006″ to .008″.

REPLACEMENT OF FLYWHEEL

Flywheels can only be replaced in one position with relation to the crankshaft. Care should be taken to see that the mating surface of the flywheel and the flange on the crankshaft are clean when the flywheel is installed. Draw the flywheel bolts up evenly and use a torque wrench to tighten them, using 55 to 60 ft. lbs. of pull. Limit of flywheel run out is .003″.

When a flywheel is replaced, it is important that the balance holes be duplicated as to size, depth, and angular location, taking into consideration the location of the flywheel with relation to the crankshaft.

Starter Ring Gear

The starter ring gear can be replaced by placing the flywheel in an arbor press, with steel blocks equally spaced around the gear. Exerting pressure will remove the gear.

To install the starter ring gear, it must be heated to expand the inside diameter so that it can be pressed over the flywheel.

LUBRICATING SYSTEM

41-42-46-47-4840 Series

Oil is drawn from a strainer in the oil pan into the pump located on the outside of the engine block, just below the carburetor. The oil, under pressure, is forced to all crankshaft and camshaft bearings, connecting rod bearings and through drilled rods to the piston pins. A limited amount is forced from the front camshaft bearing to the timing chain and sprockets.

The cylinder walls and valve tappets are lubricated by oil spray from a metered hole in the connecting rod lower bearing.

A by-pass type of oil filter is available as an accessory. It is connected to the oiling system to prevent carbon, road dust or other foreign matter from reaching the bearings and is located on the right side of the engine.

The cleaning ability of the filter becomes ineffective after 8000 miles, at which time the filter should be replaced and the oil changed as well. Add one quart of oil to the regular quantity when the filter cartridge is replaced.

Oil pressure is controlled by a pressure release valve located in the engine block to the rear of the oil pump housing. This release valve is not adjustable.

Starting with Engine No. KE-18015, 4740 Series, and Engine No. RE-11514, 4760 Series

The oil release valve plunger and spring have been changed to increase the maximum oil pressure to 50 lbs.-58 lbs. under normal operating conditions. Fig. 11. The original oil gauge has the capacity to handle the increased oil pressure, although the registration may be at the end of the indicator travel. Oil consumption will not be effected. The new plunger and spring will be supplied for service.

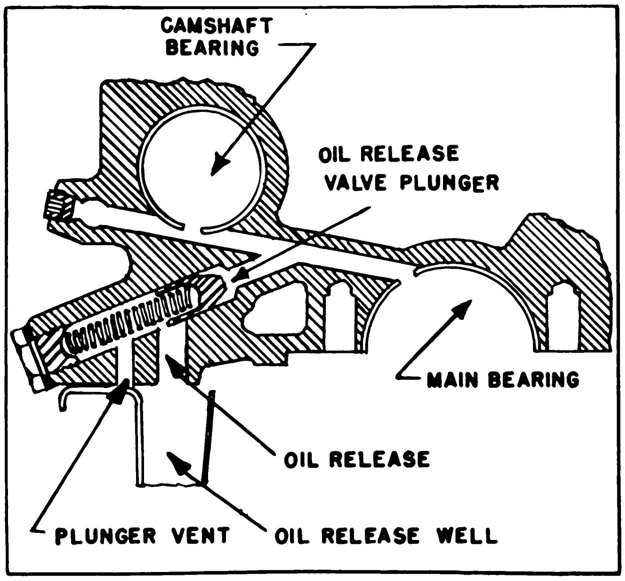


Figure 11—4840-60 Series Oil Release Valve Plunger.

Oil Pump

Starting with Engine No. KE-34134 Serial No. K-182791, 40 Series and Engine No. RE-20512, Serial No. R-457798, 60 Series, the oil pump has been redesigned to increase both delivery volume and pressure. This change was necessary in conjunction with the new 360 degree oil groove main bearings. (Page 9.) The oil pump gears are increased in length from 1¼″ to 1⅜″. In addition, the oil pump drive shaft is undercut to provide additional oil flow to the oil galleries thus taking full advantage of the increased oil pump capacity. Figure 12.

All of the parts of this pump are not interchangeable with the original pump, so in service, Nash will continue to supply parts for the original pump.

Effective with the new oil pump, an 80 lb. maximum capacity oil gauge engine unit was used. This

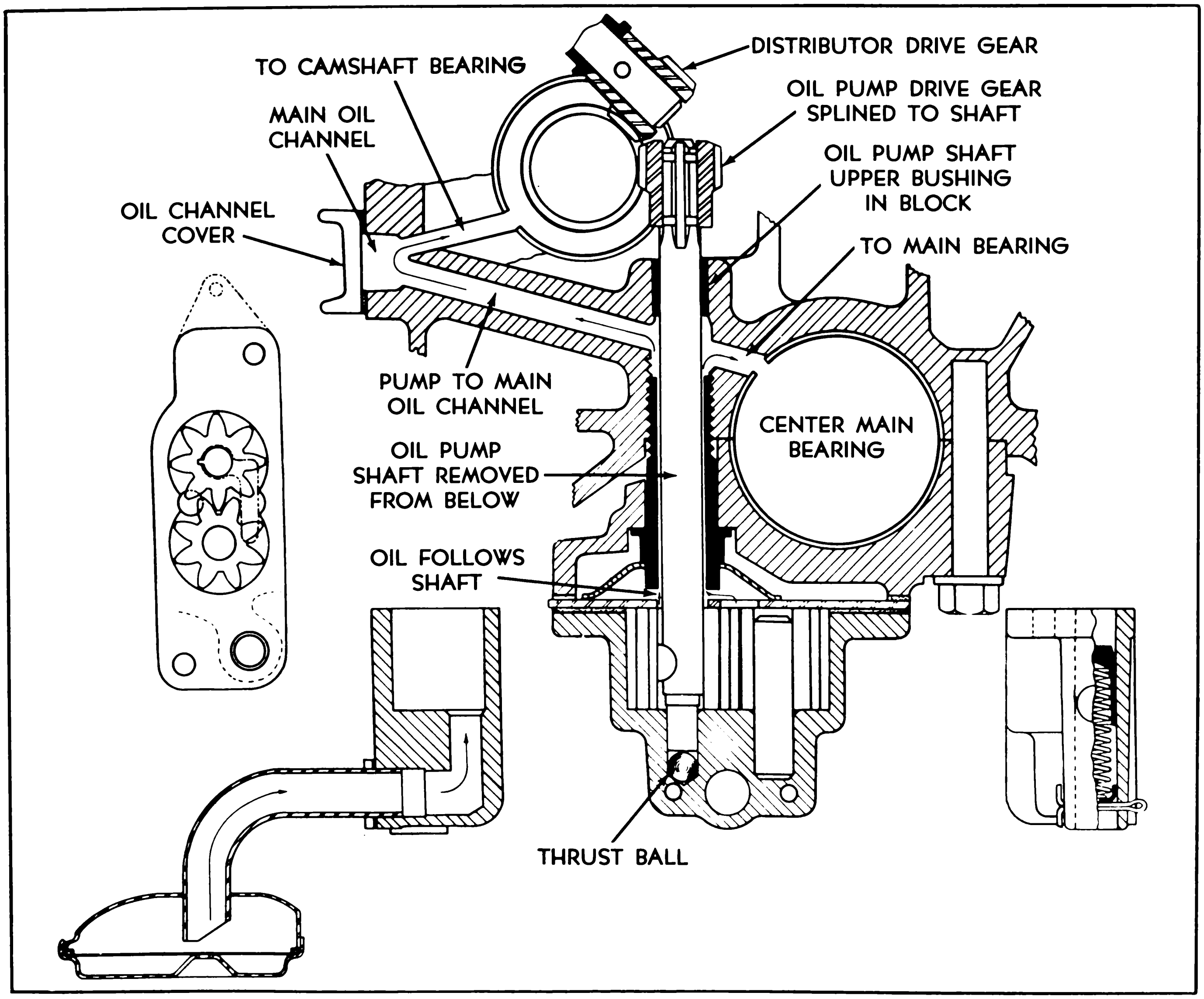

TO CAMSHAFT BEARING
DISTRIBUTOR DRIVE GEAR
OIL PUMP DRIVE GEAR SPLINED TO SHAFT
MAIN OIL CHANNEL
OIL PUMP SHAFT UPPER BUSHING IN BLOCK
OIL CHANNEL COVER
TO MAIN BEARING
PUMP TO MAIN OIL CHANNEL
CENTER MAIN BEARING
OIL PUMP SHAFT REMOVED FROM BELOW
OIL FOLLOWS SHAFT
THRUST BALL

Figure 12—4860 Series Oil Pump.

replaces the original oil gauge unit having a maximum capacity of 50 lbs.

Removal and Installation of Oil Pump

Before removing the oil pump remove the distributor cap and rotate the engine until the rotor is in the firing position for No. *1 cylinder. Then remove the oil pump and the distributor. Keep the engine in this position while the oil pump is removed.

When installing the oil pump the drive gear at the upper end of the pump shaft must mesh with the camshaft gear so that the distributor drive tongue is in the proper position. (Figure 13.)

With No. 1 piston in the firing position, on the 41-42-46-4740 series install the pump so that the tongue of the shaft is in a vertical position with the wide area at the end of the shaft to the rear of the engine when the camshaft gears and the pump gears are fully meshed. The 4840 is meshed with the tongue two teeth forward of the vertical position for ease of distributor cap removal. The distributor can now be installed with the rotor in the No. 1 firing position. Then check the engine for correct timing.

41-42-46-47-4860 Series

The oil pump on this series of engines is mounted directly to the center main bearing cap. This oil pump is driven by a gear separate from the distributor drive gear so that installation of the pump does not affect the distributor timing.

Removal and Installation of Oil Pump

The oil pump drive gear is splined with a free fit to the upper end of the oil pump shaft and meshes

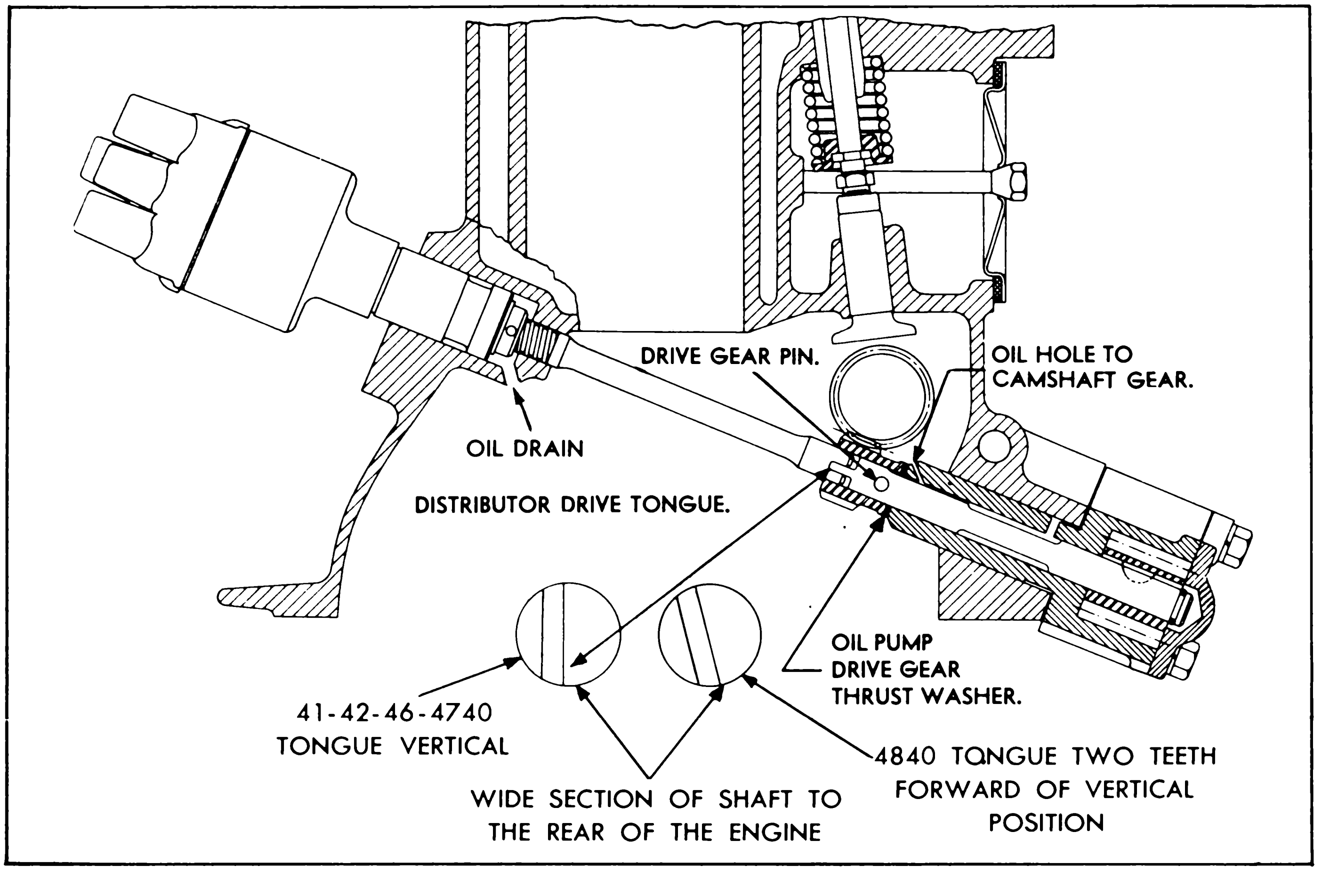

DRIVE GEAR PIN.
OIL HOLE TO CAMSHAFT GEAR.
OIL DRAIN
DISTRIBUTOR DRIVE TONGUE.
OIL PUMP DRIVE GEAR THRUST WASHER.
41-42-46-4740 TONGUE VERTICAL
4840 TONGUE TWO TEETH FORWARD OF VERTICAL POSITION
WIDE SECTION OF SHAFT TO THE REAR OF THE ENGINE

Figure 13—40 Series Oil Pump and Distributor Drive.

with the camshaft gear. The spline is a free fit so that it may be removed from the bottom of the engine after the oil pump has been removed.

This oil pump operates in a thin wall bushing pressed into the block at the upper end and into the oil pump body at the lower end. The thrust is taken on a loose steel ball at the lower end of the body. This bushing can be removed and replaced from below after removal of the pump assembly and shaft. A new bushing must be reamed to a .500″ diameter after being installed. Excessive clearance at this point will result in low oil pressure.

The oil pressure is controlled by a pressure release valve, which is not adjustable.

The inlet tube and screen assembly is attached to the bottom of the oil pump body. It is important that all connections between the oil pump inlet and the pump be air tight.

41-4280 Series

The oil pump on the 80 series engines is located inside the engine base. The drive is from an oil pump and distributor drive gear, driven from the camshaft.

Removal and Installation of Oil Pump

This oil pump can be removed from the bottom after the oil pump mounting tube to block screw is removed. (Figure 14.)

To install this pump, place the No. 1 cylinder on the firing stroke. This places the pump drive pin, located at the lower end of the distributor drive shaft, crossways to the engine. Install the pump so that the upper end of the pump shaft engages the drive pin, then turn the pump body until the hole in the oil pump mounting tube indexes with the lock screw hole in the engine block. Install the lock screw.

Oil Pump Inlet—All Series

Since the oil pump is not immersed in oil, an oil inlet tube is provided below the pump with a screen at the lower end. This screen is attached to a screen retainer which has an opening on either side so the flushing action of the oil will prevent accumulation of sediment between the screen and screen retainer.

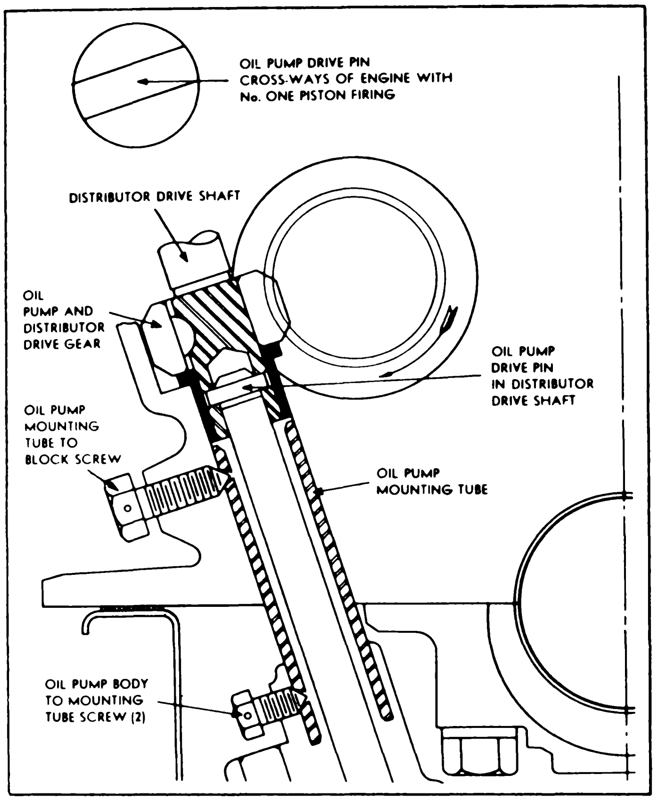

OIL PUMP DRIVE PIN CROSS-WAYS OF ENGINE WITH No. ONE PISTON FIRING
DISTRIBUTOR DRIVE SHAFT
OIL PUMP AND DISTRIBUTOR DRIVE GEAR
OIL PUMP DRIVE PIN IN DISTRIBUTOR DRIVE SHAFT
OIL PUMP MOUNTING TUBE TO BLOCK SCREW
OIL PUMP MOUNTING TUBE
OIL PUMP BODY TO MOUNTING TUBE SCREW (2)

Figure 14—80 Series Oil Pump Mounting and Drive.

40 Series

On these engines, the inlet tube is attached to the bottom flange on the engine block.

60-80 Series

On these engines the inlet tube is connected direct to the oil pump body.

CAUTION: *All connections on the inlet tube between the oil pump inlet pipe flange and the pump body should be air tight.*

VIBRATION DAMPENER

Adjustments—40-60 Series

This vibration dampener is not adjustable. The screws that retain the rubber blocks are drawn down to the point where the shoulders limit the tension of the rubber. Rubber insulation is provided between the hub and the pulley, with an anti-friction disc between the flange of the pulley hub and the front face of the crankshaft dampener.

If it is found necessary to replace the vibration dampener due to damage, the replacement part must have balance holes drilled to the same size, depth, and angular location of the original dampener in order to maintain perfect balance of the crankshaft assembly.

80 Series

This vibration dampener has four pairs of rubber blocks with plain screws for adjusting the tension of these cushions.

To disassemble this unit the location of the screws should be noted so that upon reassembly all four will be drawn down in a uniform manner. If it is necessary to vary the adjustment to correct a knocking noise all four adjusting screws should be tightened an equal amount and locked in place by peening the threaded end.

Unlike the 40 and 60 series, the area between the hub and the pulley is not provided with insulation, so it is necessary that this unit be lubricated every 2000 miles.

To lubricate remove the threaded plug found in the rim of the dampener and use a light engine oil. Then replace the plug.

ENGINE MOUNTINGS

41-42-46-47-4840 Series

Front engine mountings consist of a shackle insulated with rubber bushings. One end is attached to the engine support through a bushing welded to the support. The other end is attached to a bracket which is bolted to the front frame cross member. Retaining nuts on the two shackle studs are drawn down tight. The studs are provided with shoulders to limit the tension on the rubber bushing. A rubber bumper is provided between the frame bracket and bushing on the front engine support to limit the movement of the shackle mounting.

Rear Engine Support

The rear engine mounting consists of a rubber and steel support cushion bolted to a cross member between the body frame members.

With the rear engine mounting attached to the transmission case, in order to insulate the engine more effectively, a live rubber insulating pad is placed between the clutch housing and the rear end of the engine block.

41-42-46-4760 Series Front Engine Mounting

The front engine support consists of a rubber cushion with a steel insert. It is held to the front frame cross member by a screw threaded into the steel insert.

The cushion block can be installed in only one way—so that the square projection of the steel insert registers with the locating washer welded to the front engine support. A rectangular projection of rubber is provided on the cushion block to act against the torque of the engine. The retainer should be adjusted so that it just contacts this projection.

4860 Series Front Engine Mounting

The 4860 Series engine with the new front supports is adaptable to all series where the former supports were used.

Installation

The original 60 Series Engine Supports were attached to the frame by two studs projecting from a plate below the cross member.

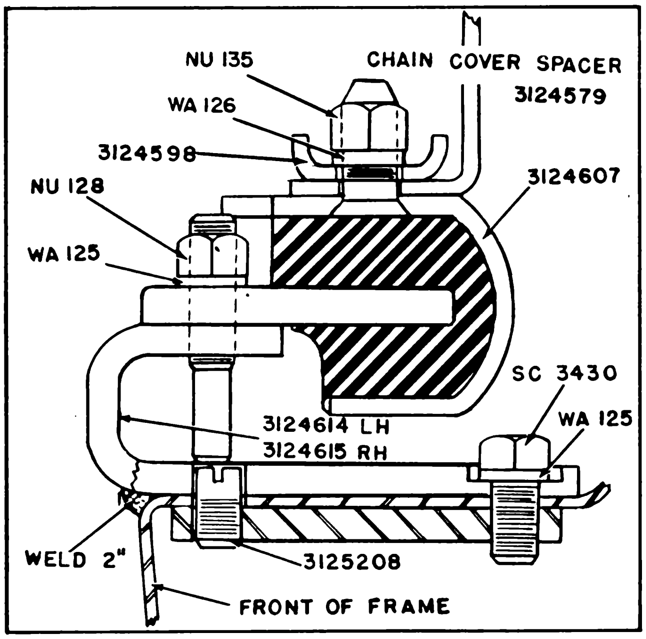


Figure 15—Engine Front Support 4860 Series Type as Used on Service Engines.

No. 3124579	Chain Cover Spacer
No. 3124614	LH Support Bracket
No. 3124615	RH Support Bracket
No. 3124607	Cushion
No. 3124598	Reinforcement
No. 3125208	Dowel Stud

The rear studs or screws, SC-3430, Fig. 15, may be used to attach the new frame brackets to the frame. The front studs may be cut off to a height of 7/32″ to serve as dowels to insure alignment or dowel studs No. 3125208 may be used. The support bracket should then be welded to the frame at the front of the cross member for its entire width of 2″. It will be necessary to disassemble the rubber cushions from these lower brackets to prevent the heat from damaging the rubber.

With the cushions reassembled to the brackets, the engine may be lowered until the cushion studs project through the slots in the chain cover spacer.

Tighten the cushion to the bracket nuts; then apply the reinforcing plates No. 3124598, followed by the washers and nuts.

All nuts and screws should have lock washers and be drawn up tight.

41-4260-80, 46-4760 Series Engine Rear Support

The rear engine support mountings are steel backed rubber cushions mounted on the rear engine cross member and retained by shoulder bolts through the clutch housing bracket. When the retaining nuts are drawn down tight the rubber cushions are held under correct tension.

4860 Series Engine Rear Support

The rear mounting consists of similar rubber cushions located on angular brackets welded to the cross member and attached to the underside of the clutch housing by bolts. This also involves a new cross-member and clutch housing.

41-4280 Series Engine Front Mountings

This engine mounting consists of an upper and a lower rubber cushion. The retaining stud is machined to a definite shoulder length so that the rubber will be under the proper tension when both the upper and lower retaining nuts are drawn down tight.

ENGINE SPECIFICATIONS

Year Series	**4840**	**4740**	**4640**	**4240**	**4140**
Type	L Head	L Head	L Head	L Head	L Head
No. of Cyls.	6	6	6	6	6
Bore	3⅛″	3⅛″	3⅛″	3⅛″	3⅛″
Stroke	3¾″	3¾″	3¾″	3¾″	3¾″
Piston Displacement	172.6	172.6	172.6	172.6	172.6
Compression Ratio	7-1	7-1	7-1	6.8-1	6.7-1
Compression Press. at Cranking speed	120 lbs. at 350 RPM	120 lbs. at 350 RPM	120 lbs. at 350 RPM	120 lbs. at 350 RPM	120 lbs. at 350 RPM
Taxable H.P.	23.44	23.44	23.44	23.44	23.44
OIL SYSTEM					
Engine Lubrication	Pressure	Pressure	Pressure	Pressure	Pressure
Oil Pump Type	Gear	Gear	Gear	Gear	Gear
Normal Oil Pressure	30 lbs. at 20 MPH	30 lbs. at 20 MPH	30 lbs. at 20 MPH	20 lbs. at 30 MPH	20 lbs. at 30 MPH
Engine Oil Refill Capacity	5 qts.	5 qts.	5 qts.	5 qts.	5 qts.
PISTONS					
Piston Type	Aluminum Alloy Split Skirt Cam Ground	Aluminum Alloy Split Skirt Cam Ground	Aluminum Alloy Split Skirt Cam Ground	Aluminum Alloy Split Skirt Cam Ground	Aluminum Alloy Split Skirt Cam Ground
Piston Clearance	.001″ to .002″ See Page 6	.001″ to .002″ See Page 6	.001″ to .002″ See Page 6	.001″ to .002″ See Page 6	.002″ See Page 6
Limits out of round	.004″	.004″	.004″	.004″	.004″
Limits of Taper	.004″	.004″	.004″	.004″	.004″
Fitting Pistons Pounds Pull Feeler Size	See Page 6	See Page 6	See Page 6	See Page 6	12 to 18 lbs. .002″ feeler
PISTON RINGS					
Number Rings per piston	3	3	3	3	3
End Gap, Minimum	.010″ to .015″	.010″ to .015″	.010″ to .015″	.010″ to .015″	.010″ to .015″
Compression Ring Width	³⁄₃₂″	³⁄₃₂″	³⁄₃₂″	³⁄₃₂″	³⁄₃₂″
Oil Ring Width	³⁄₁₆″	³⁄₁₆″	³⁄₁₆″	³⁄₁₆″	³⁄₁₆″
Compression Ring Side Clearance in Groove	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″
Oil Ring Side Clearance in Groove	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″
CYLINDER WALLS					
Out of round Limits of Cylinder	.003″	.003″	.003″	.003″	.003″
Taper Limits of Cylinder	.009″	.009″	.009″	.009″	.009″

ENGINE SECTION

Year Series	**4840**	**4740**	**4640**	**4240**	**4140**
CONNECTING RODS AND BEARINGS					
Bearing Type	Replaceable Precision	Replaceable Precision	Replaceable Precision	Replaceable Precision	Replaceable Precision
Bearing Clearance	.0015″ to .002″	.0015″ to .002″	.0015″ to .002″	.0015″ to .002″	.0015″ to .002″
Bearing End Play	.006″ to .012″	.006″ to .012″	.006″ to .012″	.006″ to .012″	.006″ to .012″
Bearing Cap Adjustments (See Note)	27 to 30 Ft. Lbs. Dry	27 to 30 Ft. Lbs. Dry	27 to 30 Ft. Lbs. Dry	27 to 30 Ft. Lbs. Dry	27 to 30 Ft. Lbs. Dry
PISTON PINS					
Type	Floating	Floating	Floating	Floating	Floating
Piston Pin Fit in Piston	See Page 7	See Page 7	See Page 7	See Page 7	See Page 7
Piston Pin Fit in Rod Bushing	See Page 7	See Page 7	See Page 7	See Page 7	See Page 7
CRANKSHAFT AND BEARINGS					
Bearing Type	Replaceable Precision	Replaceable Precision	Replaceable Precision	Replaceable Precision	Replaceable Precision
No. of Main Bearings	4	4	4	4	4
Main Bearing Clearance	.002″	.002″	.002″	.002″	.002″
Bearing Cap Adjustments (See Note)	66 to 70 Ft. Lbs. Dry	66 to 70 Ft. Lbs. Dry	66 to 70 Ft. Lbs. Dry	66 to 70 Ft. Lbs. Dry	66 to 70 Ft. Lbs. Dry
Shaft End Play	.006″ to .008″	.006″ to .008″	.006″ to .008″	.006″ to .008″	.006″ to .008″
End Thrust Taken By	Front Bearing	Front Bearing	Front Bearing	Front Bearing	Front Bearing
CAMSHAFT, VALVES, SPRINGS AND GUIDES					
Valve Seat Angle Degrees	45°	45°	45°	45°	45°
Valve Face Angle	44°	44°	44°	45°	45°
Stem Clearance in guide	.002″ to .003″	.002″ to .003″	.002″ to .003″	.002″ to .003″	.002″ to .003″
Stem Dia.	.3412″	.3412″	.3412″	.3412″	.3412″
Distance from top of block to valve guide	$\frac{27}{32}$″	$\frac{27}{32}$″	$\frac{27}{32}$″	1″	1″
Tappet Clearance Hot	.015″	.015″	.015″	.015″	.015″
Valve Spring Pressure valve closed	37 lbs. at $1\frac{3}{4}$″	37 lbs. at $1\frac{3}{4}$″	37 lbs. at $1\frac{3}{4}$″	37 lbs. at $1\frac{3}{4}$″	37 lbs. at $1\frac{3}{4}$″
Valve Spring Pressure valve open	80 lbs. at $1\frac{7}{16}$″	80 lbs. at $1\frac{7}{16}$″	80 lbs. at $1\frac{7}{16}$″	80 lbs. at $1\frac{7}{16}$″	80 lbs. at $1\frac{7}{16}$″

NOTE: If parts are oiled reduce torque 15%.

ENGINE SPECIFICATIONS

Year Series	**4840**	**4740**	**4640**	**4240**	**4140**
Valve Spring Free Length	$2\frac{3}{32}''$	$2\frac{3}{32}''$	$2\frac{3}{32}''$	$2\frac{3}{32}''$	$2\frac{3}{32}''$
Camshaft End Play	.004″ to .006″	.004″ to .006″	.004″ to .006″	.004″ to .006″	.004″ to .006″
Camshaft Drive	Chain	Chain	Chain	Chain	Chain
Cylinder Head Stud Nut lbs. pull	61-64 Ft. Lbs. Dry 57-60 Ft. Lbs. Oiled	61-64 Ft. Lbs. Dry 57-60 Ft. Lbs. Oiled	61-64 Ft. Lbs. Dry 57-60 Ft. Lbs. Oiled	61-64 Ft. Lbs. Dry 57-60 Ft. Lbs. Oiled	61-64 Ft. Lbs. Dry 57-60 Ft. Lbs. Oiled

ENGINE SPECIFICATIONS

Year Series	**4860**	**4760**	**4660**	**4260**	**4160**
Type	Overhead	Overhead	Overhead	Overhead	Overhead
No. of Cyls.	6	6	6	6	6
Bore	3⅜″	3⅜″	3⅜″	3⅜″	3⅜″
Stroke	4⅜″	4⅜″	4⅜″	4⅜″	4⅜″
Piston Displacement	234.8	234.8	234.8	234.8	234.8
Compression Ratio:					
Std.	7.02-1	7.02-1	7.02-1	6.5-1	6.3-1
Opt.	7.52-1	7.52-1	7.52-1		
Compression Press. at cranking speed	125 lbs. at 350 RPM	125 lbs. at 350 RPM	125 lbs. at 350 RPM	125 lbs. at 350 RPM	125 lbs. at 350 RPM
Horsepower SAE Brake	27.34	27.34	27.34	27.34	27.34

OIL SYSTEM

Engine Lubrication	Pressure	Pressure	Pressure	Pressure	Pressure
Oil Pump Type	Gear	Gear	Gear	Gear	Gear
Normal Oil Pressure at	30 lbs. at 20 MPH	30 lbs. at 20 MPH	30 lbs. at 20 MPH	30 lbs. at 20 MPH	30 lbs. at 20 MPH
Engine Oil Refill Capacity	6 qts.	6 qts.	6 qts.	6 qts.	6 qts.

PISTONS

Piston Type	Alum. Alloy Split Skirt Cam Ground	Alum. Alloy Split Skirt Cam Ground	Alum. Alloy Split Skirt Cam Ground	Alum. Alloy Split Skirt Cam Ground	Alum. Alloy Split Skirt Cam Ground
Piston Clearance	.001″ to .002″ See Page 6	.001″ to .002″ See Page 6	.001″ to .002″ See Page 6	.001″ to .002″ See Page 6	.001″ to .002″ See Page 6
Limits out of round	.004″	.004″	.004″	.004″	.004″
Limits of Taper	.004″	.004″	.004″	.004″	.004″
Fitting Pistons Pounds Pull Feeler Size	See Page 6	See Page 6	See Page 6	See Page 6	See Page 6

PISTON RINGS

Number of Rings per Piston	4	4	4	4	4
End Gap, Minimum	.010″ to .015″	.010″ to .015″	.010″ to .015″	.010″ to .015″	.010″ to .015″
Compression Ring Width	3/32″	3/32″	3/32″	3/32″	3/32″
Oil Ring Width	5/32″	5/32″	5/32″	5/32″	5/32″
Compression Ring Side Clearance in Groove	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″
Oil Ring Side Clearance in Groove	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″

ENGINE SPECIFICATIONS

Year Series	**4860**	**4760**	**4660**	**4260**	**4160**
CYLINDER WALLS					
Out of Round Limits of the Cylinder	.003″	.003″	.003″	.003″	.003″
Taper Limits of the Cyl.	.009″	.009″	.009″	.009″	.009″
CONNECTING ROD AND BEARINGS					
Bearing Type	Replaceable Precision	Replaceable Precision	Replaceable Precision	Replaceable Precision	Replaceable Precision
Bearing Clearance	.0015″ to .0025″	.0015″ to .0025″	.0015″ to .0025″	.0015″ to .002″	.0015″ to .002″
Bearing End Play	.006″ to .014″	.006″ to .014″	.006″ to .014″	.006″ to .014″	.006″ to .014″
Bearing Cap Adjustment (See Note)	50 to 55 Ft. Lbs. Dry	50 to 55 Ft. Lbs. Dry	50 to 55 Ft. Lbs. Dry	50 to 55 Ft. Lbs. Dry	50 to 55 Ft. Lbs. Dry
PISTON PINS					
Type	Floating	Floating	Floating	Floating	Floating
Piston Pin Fit in Piston	See Page 7	See Page 7	See Page 7	See Page 7	See Page 7
Piston Pin Fit in Rod Bushing	See Page 7	See Page 7	See Page 7	See Page 7	See Page 7
CRANKSHAFT AND BEARINGS					
Bearing Type	Replaceable Precision	Replaceable Precision	Replaceable Precision	Replaceable Precision	Replaceable Precision
No. of Main Bearings	7	7	7	7	7
Main Bearing Clearance	.0015″ to .0025″	.0015″ to .0025″	.0015″ to .0025″	.0015″ to .0025″	.0015″ to .0025″
Shaft End Play	.006″ to .008″	.006″ to .008″	.006″ to .008″	.006″ to .010″	.006″ to .010″
End Thrust taken by	Center Bearing	Center Bearing	Center Bearing	Center Bearing	Center Bearing
Bearing Cap Adjustment (See Note)	66 to 70 Ft. Lbs. Dry	66 to 70 Ft. Lbs. Dry	66 to 70 Ft. Lbs. Dry	66 to 70 Ft. Lbs. Dry	66 to 70 Ft. Lbs. Dry
CAMSHAFT, VALVES, SPRINGS AND GUIDES					
Valve Seat Angle	45°	45°	45°	45°	45°
Valve Face Angle	44°	44°	44°	45°	45°
Stem Clearance in Guide	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″
Stem Diameter	.3725″	.3725″	.3725″	.3725″	.3725″
Distance from head to top of Valve Guide	7/8″	7/8″	7/8″	15/16″	15/16″
Tappet Clearance, Hot	.015″	.015″	.015″	.015″	.015″
Valve Spring Pressure, Valve Closed	53 lbs. at 1 11/16″	53 lbs. at 1 11/16″	53 lbs. at 1 11/16″		
Valve Spring Pressure, Valve Open	146 lbs. at 1 11/32″	146 lbs. at 1 11/32″	146 lbs. at 1 11/32″		

NOTE: If parts are oiled reduce Torque 15%.

Year Series	**4860**	**4760**	**4660**	**4260**	**4160**
Valve Open Inner Spring Pressure Outer Spring Pressure				51 lbs. at 1 1/32″ 95 lbs. at 1 11/32″	51 lbs. at 1 1/32″ 95 lbs. at 1 11/32″
Valve Closed Inner Spring Pressure Outer Spring Pressure				21 lbs. at 1 3/8″ 38 lbs. at 1 11/16″	21 lbs. at 1 3/8″ 38 lbs. at 1 11/16″
Valve Spring Free Length				Inner Spring 1 21/32″ Outer Spring 2″	Inner Spring 1 21/32″ Outer Spring 2″
Valve Spring Free Length	2 3/32″	2 3/32″	2 3/32″		
Camshaft End Play	.004″ to .006″	.004″ to .006″	.004″ to .006″	.004″ to .006″	.004″ to .006″
Camshaft Drive	Chain	Chain	Chain	Chain	Chain
Cylinder Head Stud Nut lbs. pull	65-70 Ft. Lbs. Dry 60-65 Ft. Lbs. Oiled	65-70 Ft. Lbs. Dry 60-65 Ft. Lbs. Oiled	65-70 Ft. Lbs. Dry 60-65 Ft. Lbs. Oiled	65-70 Ft. Lbs. Dry 60-65 Ft. Lbs. Oiled	65-70 Ft. Lbs. Dry 60-65 Ft. Lbs. Oiled

ENGINE SPECIFICATIONS

Year Series	4280	4180
Type	Overhead	Overhead
No. of Cyls.	8	8
Bore	3⅛″	3⅛″
Stroke	4¼″	4¼″
Piston Displacement	260.8	260.8
Compression Ratio	6.6-1	6.3-1
Compression Press. at cranking speed	110 lbs. at 350 RPM	110 lbs. at 350 RPM
Horsepower SAE Brake	31.25	31.25

OIL SYSTEMS

Engine Lubrication	Pressure	Pressure
Oil Pump Type	Gear	Gear
Normal Oil Pressure	30 lbs. at 20 MPH	30 lbs. at 20 MPH
Engine Oil refill capacity	7 qts.	7 qts.

PISTONS

Piston Type	Invar-Strut	Invar-Strut
Piston Clearance	.001″ to .0025″ See Page 7	.001″ to .0025″ See Page 7
Limits out-of-round	.004″	.004″
Limits of Taper	.004″	.004″
Fitting Pistons Pounds Pull Feeler size	See Page 7	See Page 7

PISTON RINGS

No. of Rings per Piston	4	4
End Gap, Minimum	.010″ to .015″	.010″ to .015″
Compression Ring Width	⅛″	⅛″
Oil Ring Width:		
(Upper)	⅛″	⅛″
(Lower)	3/16″	3/16″
Compression Ring Side Clearance in Ring Groove	.002″ to .004″	.002″ to .004″
Oil Ring Side Clearance in Groove	.002″ to .004″	.002″ to .004″

Year Series	4280	4180
CYLINDER WALLS		
Out Round Limits of the Cylinder	.003″ Max.	.003″ Max.
Taper Limits of Cylinder	.009″ Max.	.009″ Max.
CONNECTING ROD AND BEARING		
Bearing Type	Replaceable Precision	Replaceable Precision
Bearing Clearance	.0015″ to .002″	.0015″ to .002″
Bearing End Play	.006″ to .010″	.006″ to .010″
Bearing Cap Adjustment (See Note)	50 to 55 Ft. Lbs. Dry	50 to 55 Ft. Lbs. Dry
PISTON PINS		
Type	Floating	Floating
Piston pin fit in the piston	See Page 7	See Page 7
Piston pin fit in rod bushing	See Page 7	See Page 7
CRANKSHAFT AND BEARINGS		
Bearing Type	Replaceable Precision	Replaceable Precision
No. of Main Bearings	9	9
Main Bearing Clearance	.0015″ to .0025″	.0015″ to .0025″
Shaft End Play	.006″ to .010″	.006″ to .010″
End Thrust taken by	Center Bearing	Center Bearing
Bearing Cap Adjustment (See Note)	70 to 73 Ft. Lbs. Dry	70 to 73 Ft. Lbs. Dry
CAMSHAFT, VALVES, SPRINGS AND GUIDES		
Valve Seat Angle	45°	45°
Valve Face Angle	44°	44°
Stem Clearance in Guide	.002″ to .004″	.002″ to .004″
Stem Diameter	.3725″	.3725″
Distance from head to top of valve guide	$1\frac{5}{16}''$	$1\frac{5}{16}''$
Tappet Clearance, Hot	.015″	.015″

NOTE: If parts are oiled reduce Torque 15%.

ENGINE SPECIFICATIONS

Year Series	4280	4180
Valve Closed		
Inner Spring Pressure	21 lbs. at $1\frac{3}{8}$"	21 lbs. at $1\frac{3}{8}$"
Outer Spring Pressure	38 lbs. at $1\frac{11}{16}$"	38 lbs. at $1\frac{11}{16}$"
Valve Open		
Inner Spring Pressure	51 lbs. at $1\frac{1}{32}$"	51 lbs. at $1\frac{1}{32}$"
Outer Spring Pressure	95 lbs. at $1\frac{11}{32}$"	95 lbs. at $1\frac{11}{16}$"
Valve Spring Free Length		
Inner Spring	$1\frac{21}{32}$"	$1\frac{21}{32}$"
Outer Spring	2"	2"
Camshaft End Play	.004" to .006"	.004" to .006"
Camshaft Drive	Chain	Chain
Cylinder Head Stud Nut lbs. pull	65-70 Ft. Lbs. Dry 60-65 Ft. Lbs. Oiled	65-70 Ft. Lbs. Dry 60-65 Ft. Lbs. Oiled

COOLING SYSTEM SECTION

Nash

TECHNICAL
MANUAL

FAN BELT	2
FAN AND FAN HUB	3
THERMOSTATS	3
WATER PUMP	4
RADIATOR	5
RADIATOR HOSE	5
DRAINING THE SYSTEM	5
FLUSHING THE SYSTEM	5
ANTI-FREEZE	5
SPECIFICATIONS	6-7

COOLING SYSTEM SECTION
NASH TECHNICAL MANUAL

FAN BELT

Description

The fan belt is of the Vee design that makes use of the two sides of the belt for its friction surfaces; this belt should never ride on the bottom of the pulley groove.

The belt is driven by the crankshaft pulley and drives the fan hub and generator, which in turn drives the water pump, attached at the rear of the generator.

Fan Belt Adjustment

For the fan belt to operate efficiently, it should be tight. To inspect the tension of the fan belt, press the belt with your thumb, midway between the fan pulley and the generator pulley. If the belt can be deflected more than ½", it is an indication that the belt is loose and should be tightened.

Inspect the belt for wear or fraying. Replace it with a new belt if it shows any signs of failure.

To replace a fan belt, loosen the fan hub bracket at the front of the engine and lower the fan pulley until the belt can be removed from the pulley. Then, slip the belt over the fan after removing it from the crankshaft pulley.

To replace the belt, first slip it over the fan and down under the crankshaft pulley. Then work it over the fan pulley.

> CAUTION: *Do Not Pry the Belt over the Fan pulley with a Screw Driver. Belts are damaged by this method of installation.*

Adjust the fan hub bracket until the tension of the belt is within the ½" deflection, halfway between the fan pulley and the generator pulley.

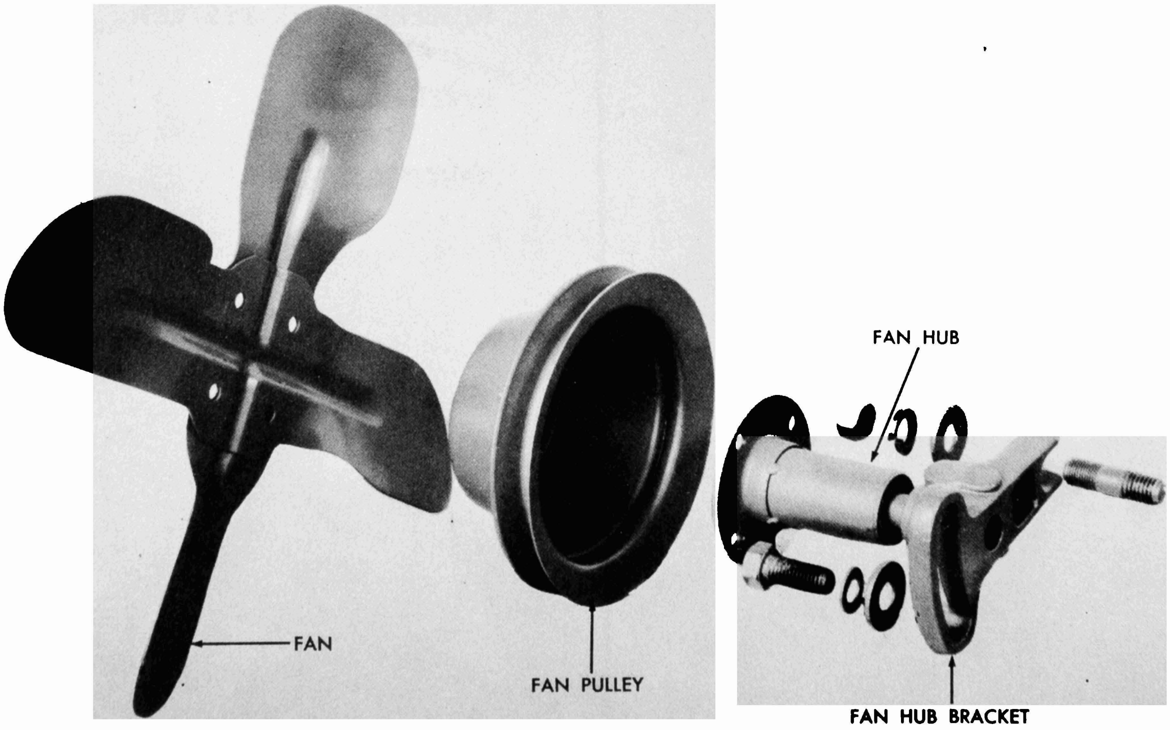


Figure 1—40 Series Nash Type Fan and Hub Assembly.

Correct any misalignment between the two pulleys by moving the bracket away from the engine or shimming behind the bracket.

FAN AND FAN HUB

Description

There have been two types of fans used in all series. The Nash fan hub assembly and the Schwitzer-Cummins fan hub assembly. As a matter of identification, the Nash type fan has a small hub and the fan is secured to the hub by four screws. The fan hub is equipped with pre-lubricated ball bearings, with no provision for subsequent lubrication (Fig. 1). The Schwitzer-Cummins fan has a large fan hub and the fan is secured to the hub by eight screws. This type of fan hub requires lubrication, which is provided through an oil filler plug in the fan hub (Fig. 2).

Cars that are operated at low speed in heavy traffic may require a special fan to increase the volume of air through the radiator. Special fans have been provided for this condition, as follows:

41-42-46-47-4840 Series, a special six bladed fan is available. This fan (No. 3111901) has the mounting holes drilled so that it will fit either the Nash fan hub or the Schwitzer-Cummins fan hub assembly.

41-42-46-47-4860 Series, with the Nash type fan hub, special fan No. 3106396 is available.

41-42-46-47-4860 Series, with the Schwitzer-Cummins type fan hub, special fan No. 3110609 is available.

THERMOSTAT

A thermostat is placed between the radiator top tank and the cylinder head to prevent the coolant from circulating through the system until the engine has reached its efficient operating temperature, approximately 160 degrees F. The thermostat is of the sylphon type and is equipped with a simple poppet valve with a knife edge to prevent dirt from fouling the valve.

Testing a Thermostat

To test a thermostat immerse the unit in warm water, bring the temperature up to 157 to 162 degrees. Increase the water temperature until the valve starts to open. At 20 degrees above the starting point the valve should be fully open.

The engine temperature is indicated by a temperature gauge on the instrument panel. This temperature gauge is connected to a thermocoupling, located in the cylinder head. Refer to page 6, Electrical Section.

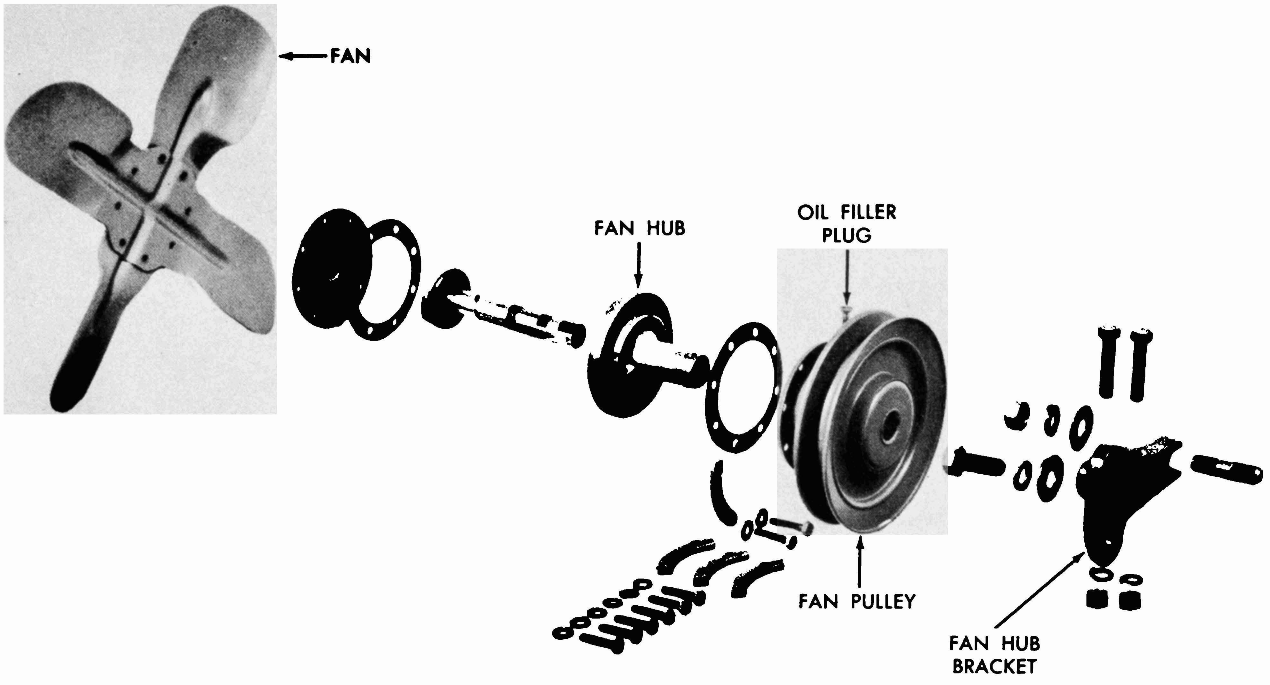


Figure 2—40 Series Schwitzer-Cummins Fan and Hub Assembly.

WATER PUMP—All Series

Description

The water pump is the centrifugal blade type, which is driven from a flexible coupling connected to the rear of the generator shaft. The pump housing is provided with a bronze bushing for the pump shaft. The shaft is sealed at the front of the housing by a packing ring and nut. Any indication of a water leak at this nut can be corrected by tightening the packing nut. Always tighten this nut with the engine running, and just enough to stop the water leak. If repacking is required, refer to page 4, Water Pump Assembly.

Removing a Water Pump from the Engine—All Series

Drain the water from the system. (If anti-freeze is used, drain into a clean receptacle so that it can be replaced.) Remove the rear bolt from the flexible coupling on the pump shaft. Remove the lower hose connection from the water pump. Remove the two cap screws that hold the pump housing to the engine block.

Water Pump Disassembly

The water pump impeller or blade is installed in the slotted end of the water pump shaft, held in place by a tubular brass rivet. A removable plug in the pump body permits the removal and installation of this rivet (Fig. 3). By removal of the plug and supporting the shaft through the water outlet hole, the rivet can be driven out with a small punch.

Remove the packing nut, which will allow the pump shaft to be removed. Clean out the old packing from the pump body so that the bushing can be removed. Use Water Pump Bushing Remover and Replacer Tool J-1419 to remove the bushing.

Inspect all parts of the pump for indication of water leaks. Inspect the shaft for wear where it is sealed by the packing. Replace it if it is scored or damaged.

Water Pump Assembly

Install a new bushing in the pump body, using J-1419 Installing Tool. Then ream the bushing, using the Bushing Reamer KMO-314.

Install the water pump shaft into the housing (slotted end) and place the blade into the slot indexing the rivet holes of the shaft and the blade. Install a new brass tubular rivet through the shaft and blade. Peen the rivet over, supporting the shaft through the water outlet hole.

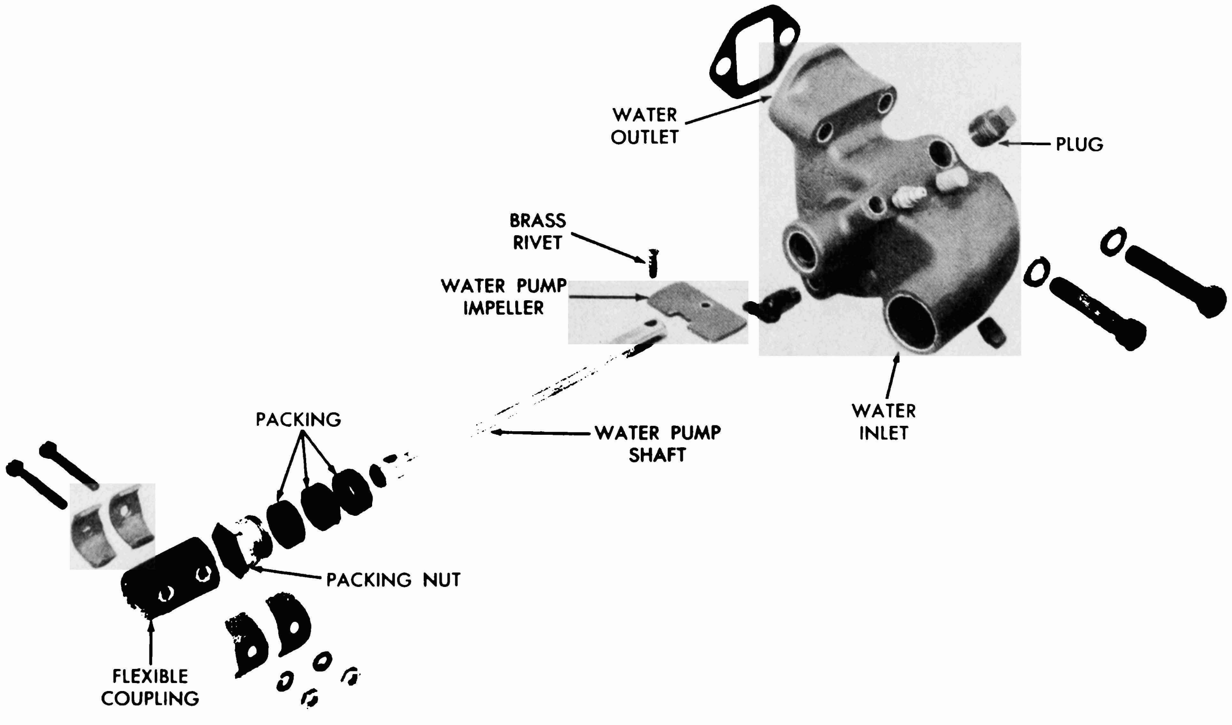


Figure 3—40 Series Water Pump Assembly.

Install three rings of packing, one at a time, drawing each ring down with the packing nut. After the last ring is installed, do not draw the packing nut up tight until the pump has been installed on the engine, lubricated, and allowed to run.

Lubrication

Lubricate the water pump with water pump lubricant. Do not use a pressure gun at this point; use the lubricant sparingly as over-lubrication will force the lubrication into the cooling solution.

Assembly of the Water Pump to the Engine

Always use a new gasket when installing a water pump to the engine block; use a sealing compound on the gasket.

When installing the water pump to the engine, reverse the procedure used in removal.

RADIATOR

Description—41-42-46-47-4840 Series

This radiator is of the conventional tube and fin design with the tubes in a vertical position, so that the water flows from top to bottom. A top tank is provided for water expansion and circulation.

41-4260-80, 46-47-4860 Series

This radiator is a cross flow type, with the tubes placed horizontally, which permits the water to flow from left to right. On this type of radiator an auxiliary tank provides space for water expansion. This tank unit can be separated from the radiator core in service.

RADIATOR HOSE

Specification for the radiator hose to be used on all series will be found on pages 6 and 7.

DRAINING THE SYSTEM

The 41-42-46-47-4840 Series cooling system is drained by a valve at the lower left base of the radiator and a valve at the base of the water pump.

The 41-4260-80, 46-47-4860 Series cooling system is drained by a valve at the lower right base of the radiator.

FLUSHING THE COOLING SYSTEM

The cooling system should be flushed (recommended in the spring of each year) to insure satisfactory cooling and maintain efficient engine operation.

In flushing the cooling system the thermostat should be removed and the radiator flusher tool J-708-A used. Flush the system by reversing the flow of water through the system. After a thorough flushing of the system attention should be given to the various gasket points and hose connections. Replace if necessary.

ANTI-FREEZE

No specific recommendations are made as to the type of anti-freeze that should be used, but we do recommend that only brands sold by reputable concerns be used. The mixture formula will vary with the different types. The manufacturer's specifications should be followed in all cases.

COOLING SPECIFICATIONS

Year Series	**4140**	**4240**	**4640**	**4740**	**4840**
Cooling System Capacity—Quarts	14	14	14	14	14
Radiator Make	McCord	McCord	McCord	McCord	McCord
Radiator Type	Vertical Tube	Vertical Tube	Tube and Fin	Tube and Fin	Tube and Fin
Pressure Relief Valve	Yes	Yes	Yes	Yes	Yes
Thermostat Make	Fulton	Fulton	Fulton	Fulton	Fulton
Thermostat Starts to Open, Degrees Fahrenheit	157-162	157-162	157-162	157-162	157-162
Water Pump Type	Centrifugal Blade	Centrifugal Blade	Centrifugal Blade	Centrifugal Blade	Centrifugal Blade
Water Pump Drive	Belt	Belt	Belt	Belt	Belt
Angle of Belt Vee	32°	32°	32°	32°	32°
Water Jacket Full Length of Cyls.	Yes	Yes	Yes	Yes	Yes
Upper Radiator Hose, I.D.	1½″	1½″	1½″	1½″	1½″
Upper Radiator Hose, Length	7¾″	7¾″	7¾″	7¾″	7¾″
Lower Radiator Hose, I.D.	1½″	1½″	1½″	1½″	1½″
Lower Radiator Hose, Length	2 Pc. 3¼″	2 Pc. 3¼″	2 Pc. 3¼″	2 Pc. 3¼″	2 Pc. 3¼″
Year Series	**4160**	**4260**	**4660**	**4760**	**4860**
Cooling System Capacity—Quarts	17	17	17	17	17
Radiator Make	McCord	McCord	McCord	McCord	McCord
Radiator Type	Fin & Tube Cross Flow	Fin & Tube Cross Flow	Fin & Tube Cross Flow	Fin & Tube Cross Flow	Fin & Tube Cross Flow
Pressure Relief Valve	Yes	Yes	Yes	Yes	Yes
Thermostat Make	Fulton	Fulton	Fulton	Fulton	Fulton
Thermostat Starts to Open, Degrees Fahrenheit	157-162	157-162	157-162	157-162	157-162
Water Pump Type	Centrifugal Blade	Centrifugal Blade	Centrifugal Blade	Centrifugal Blade	Centrifugal Blade
Water Pump Drive	Belt	Belt	Belt	Belt	Belt
Angle of Belt Vee	32°	32°	32°	32°	32°
Water Jacket Full Length of Cyls.	Yes	Yes	Yes	Yes	Yes
Upper Radiator Hose, I.D.	1¼″	1¼″	1¼″	1¼″	1¼″
Upper Radiator Hose, Length	2 Pc. 3″ and 8″	2 Pc. 3″ and 8″	2 Pc. 3″ and 8″	2 Pc. 3″ and 8″	2 Pc. 3″ and 8″
Lower Radiator Hose, I.D.	1½″	1½″	1½″	1½″	1½″
Lower Radiator Hose, Length	3¼″	3¼″	3¼″	3¼″	3¼″

COOLING SPECIFICATIONS

Year Series	**4180**	**4280**
Cooling System Capacity—Quarts	16	16
Radiator Make	McCord	McCord
Radiator Type	Fin & Tube Cross Flow	Fin & Tube Cross Flow
Pressure Relief Valve	No	No
Thermostat Make	Fulton	Fulton
Thermostat Starts to Open, Degrees Fahrenheit	157-162	157-162
Water Pump Type	Centrifugal Blade	Centrifugal Blade
Water Pump Drive	Belt	Belt
Angle of Belt Vee	32°	32°
Water Jacket Full Length of Cyls.	Yes	Yes
Upper Tank to Radiator Hose, I.D.	1¾″	1¾″
Upper Tank to Radiator Hose, Length	8″	8″
Upper Radiator Hose, I.D.	1½″	1½″
Upper Radiator Hose, Length	4½″	4½″
Lower Radiator Hose, I.D.	1½″	1½″
Lower Radiator Hose, Length	2 Pc. 3¼″	2 Pc. 3¼″

ELECTRICAL SECTION

Nash

TECHNICAL MANUAL

GENERATOR 2
CIRCUIT BREAKER 3
CURRENT REGULATOR 3
VOLTAGE REGULATOR 3
BATTERY 4
IGNITION SYSTEM 4
HEAD LAMPS 5
STARTING MOTOR 6
ELECTRIC TELEGAGES 6
HORN EQUIPMENT 7
SPECIFICATIONS 9-12
SPECIFICATIONS DELCO-REMY 13

ELECTRICAL SECTION
NASH TECHNICAL MANUAL

GENERATOR

Description

The generator is the heavy-duty shunt type—two brush, six volts, belt driven. The armature rotates in a clockwise direction as viewed from the drive end. Ventilation is provided by a centrifugal fan on the pulley end of the armature shaft. The shaft is supported by ball bearings at both ends. (Figure 1.)

Make and Model Specifications will be found on page 9. The maximum output of the generator is controlled by a voltage and current regulator, mounted on the engine side of the dash.

Lubrication

The generator ball bearings are lubricated through hinge cap oilers located at either end of the generator housing.

The amount of oil required is 8 to 10 drops of light engine oil every 5000 miles of operation.

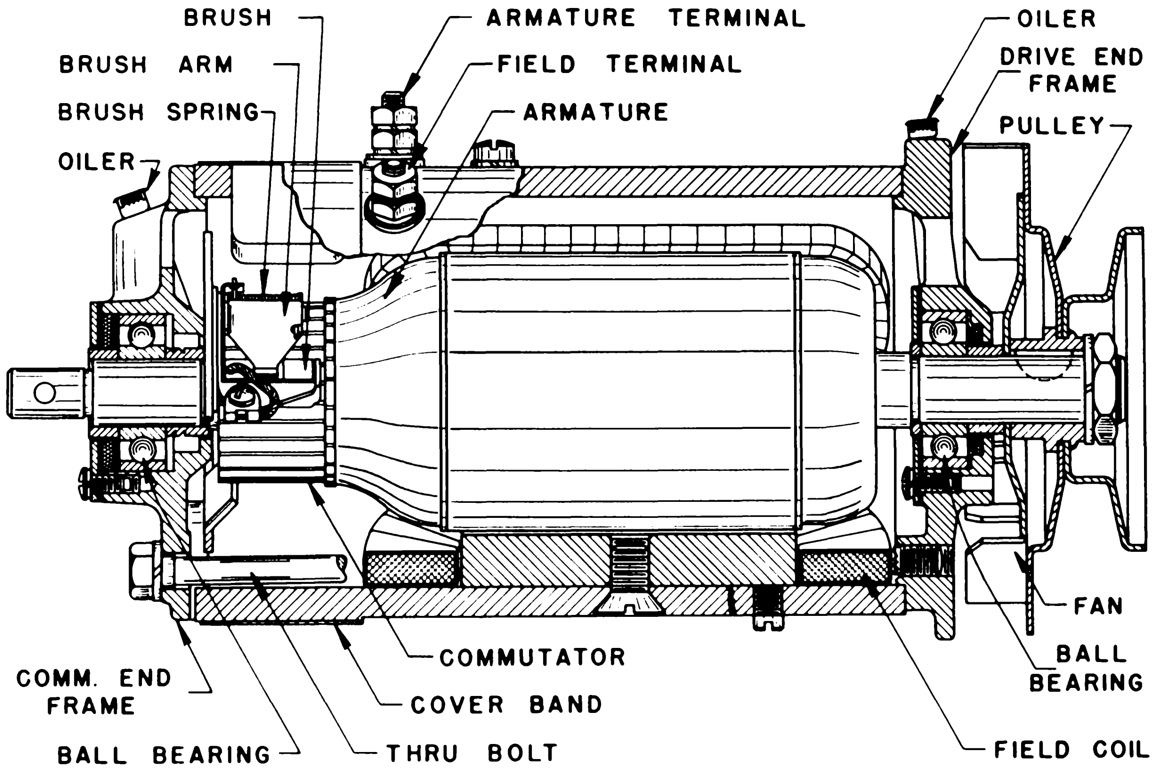
> CAUTION: *Do not over-lubricate and DO NOT LUBRICATE THE COMMUTATOR.*

Inspection

The cover band should be removed and the commutator and brushes inspected at regular intervals. Make sure that brushes and commutator are not worn and do not show any signs of arcing.

Commutators

When the commutators are dirty or gummy they should be cleaned with a strip of No. 00 sandpaper held against the commutator with a piece of soft wood for a few seconds while the generator is in operation. NEVER USE EMERY CLOTH TO CLEAN THE COMMUTATOR. Blow out all dust.



BRUSH
BRUSH ARM
BRUSH SPRING
OILER
ARMATURE TERMINAL
FIELD TERMINAL
ARMATURE
OILER
DRIVE END FRAME
PULLEY
FAN
BALL BEARING
FIELD COIL
COMMUTATOR
COVER BAND
THRU BOLT
COMM. END FRAME
BALL BEARING

Figure 1—Nash Generator.

If the commutator is rough or out of round, or has high mica, it should be turned down in a lathe and the mica undercut.

Brush Spring Tension

The brush spring tension should be 25 ounces. Excessive tension will cause rapid wear on the brushes and commutator. Low spring tension will cause arcing and burning of the commutator and brushes and reduce the output of the generator.

Brushes should be free in their holders and the pig-tails well connected. Worn brushes should be replaced. New brushes may be seated by the use of a bedding stone. (A bedding stone is an abrasive material which can be held against the commutator as it is revolving.) The stone will disintegrate and carry under the brush, seating it in a second or two. The stone should be moved back and forth along the area contacted by the brushes. Blow out all dust. NEVER USE EMERY CLOTH TO SEAT BRUSHES.

Field Current

The field current should be 1.76 to 1.88 amperes at 6 volts. Follow the instructions as given by the equipment used to test field current.

Polarity

After a generator has been disconnected and then reconnected, it should not be operated until the following polarity correction is made. Connect between the GEN and BAT terminals of the regulator momentarily with a jumper lead. The momentary surge of battery current to the generator assures that the generator will be correctly polarized with respect to the battery it is to charge.

CAUTION: *Never operate the generator open circuit since this would allow it to build up sufficient voltage to cause serious damage to the unit.*

CIRCUIT BREAKER, CURRENT AND VOLTAGE REGULATOR

Circuit Breaker—Description

The circuit breaker is also the relay cut-out and acts as a safety device which opens and closes the circuit between the generator and the battery. At low engine R.P.M. the generator output is not great enough to carry the load. At this time the relay cut-out is open, so that the battery is carrying the electrical load. But when the generator speed is increased enough, the points in relay cut-out close and the generator is put into the circuit and will carry the load. At the same time, it is recharging the battery. It is the unit of the three-unit voltage regulator nearest the bottom or battery terminal.

Inspection

Follow the instructions as given for the type of testing used. Connect a voltmeter and ammeter as instructed. Then increase the generator speed until the voltmeter registers voltage above the battery voltage. The points in the relay cut-out should close at 6.2 to 6.7 volts. If not within the limits specified inspect the following:

1. **Air Gap** — The air gap specifications are found on page 9, for the series car being tested. To adjust the air gap, loosen the two screws at the back of the relay and raise or lower the armature as required. Tighten the screws after the adjustment.

2. **Point Opening** — The point opening should be .020″ and is adjusted by bending the upper armature stop.

3. **Closing Voltage** — The closing voltage should be 6.2 to 6.7 volts and is adjusted by bending the spring post down to decrease the spring tension and the closing voltage, or up to increase the spring tension and the closing voltage.

Current Regulator Description

The current regulator limits the output of the generator to its maximum, irrespective of the load imposed on the electrical system (refer to Specifications, page 9). It is the unit nearest the center or field terminal of the regulator.

Testing

The current regulator is set to operate at the amperage specified in the Specification Section, page 9. Follow the instructions of the testing equipment used to test the correct amperage of the regulator.

CAUTION: *Always make regulator tests at the operating temperature of the regulator.*

Air Gap — The air gap is measured between the center of the core and the armature with the points just closing. Push the armature all of the way down by hand, allow it to come back until the points are just touching, then measure the air gap, check specifications on page 9.

To adjust, loosen the two contact mounting screws and move the contact support up or down as required. Be sure that the points are lined up with each other, then tighten the contact screws.

Current Setting — Bend the lower spring hanger, of the current regulator unit, down to increase the current setting. Bend the lower spring hanger up to decrease the current setting. There are two springs governing the current setting, normally, all adjustments are made by bending one spring hanger, the other should not be touched. If the regulator is badly out of adjustment, remove one spring and adjust the other spring to 16 to 17 amperes, install the other spring and complete the adjustment to the correct current setting.

The Regulator Must be at Operating Temperature when Current Reading is Taken or Adjustments are made.

Voltage Regulator Description

The voltage regulator controls the generator charging rate according to the state of charge of the battery. When the battery is discharged its voltage drops below that required to operate the voltage regulator. The regulator allows the generator to charge to its maximum output. As the battery becomes charged the voltage rises and puts the regulator into operation, thus reducing the generator output.

The voltage regulator is set to operate at the voltages specified in the Specifications Section, page 9. Follow the instructions of the testing equipment used to test for the correct voltage of the regulator.

BATTERY

The battery is a three cell, six volt unit, with adequate storage capacity for the normal requirements of the car, including the approved accessories.

The battery is located in a carrier below the floor board under the front seat. This makes it readily accessible for inspection and maintenance by removal of the front seat cushion and the battery cover. The battery should be inspected every month or every 1000 miles as necessary. The addition of water, particularly in cold weather, should be made just previous to operating the car above charging speed, to insure mixture of the water with the acid.

Testing

At regular intervals the battery should be tested with a hydrometer. The battery should register not less than 1.250 in climates where freezing occurs and not less than 1.225 under more moderate conditions.

The efficiency of the battery should be tested for voltage and output using battery testing equipment. Follow the instructions of the testing equipment for making the test.

IGNITION SYSTEM

Description

The ignition system consists of the Battery, Ignition Switch, Ignition Coil, Condenser, Distributor, High Tension Wires and the Spark Plugs. The generator is the source of supply for keeping the battery charged. There are two circuits in the ignition system. First, the primary circuit which consists of the source of electrical energy — Ignition switch, distributor and points, condenser, and primary winding of the ignition coil. Second, the secondary circuit which consists of the secondary winding of the ignition coil, the rotor and distributor cap, the high tension wires and the spark plugs.

Testing Ignition Circuit

To get full efficiency from the ignition system it is important that all contacts in the primary and secondary circuits be free from corrosion and that all terminals be tight.

Test all units in the primary circuit using the specifications on page 10. Follow the instruction of the testing equipment for making the test.

1. **Battery.** Test specific gravity and voltage.
2. **Starter.** Test the starter for amperage draw, free running and under locked torque test.
3. **Coil.** Test the coil for capacity, open or grounded circuits and efficiency at high speed.
4. **Condenser.** Test the condenser for capacity. Test for leaks and high resistance.
5. **Distributor.** Test the condition of the distributor points, point opening, contact point pressure and the distributor dwell angle. Test the distributor for resistance or current loss within the distributor. Test the vacuum advance and the centrifugal advance using a distributor tester.
6. **Engine Timing.** Adjust the distributor timing to the specifications found on page 10.

Test all units of the High Tension or Secondary circuit.

1. **Distributor Cap.** Clean the distributor cap and inspect it for checks and cracks that would cause a spark jump.

2. **Distributor Rotor.** Inspect the rotor for cracks and the rotor brush for burning. Inspect the gap between the rotor brush and the contact posts in the distributor cap.
3. **High Tension Wires.** Test for leaks, replace if defective.
4. **Spark Plugs.** Clean and test spark plugs in a spark plug cleaner and tester.

HEAD LAMPS

Description

The sealed beam headlighting system is used on all series cars. These lamps are designed so that the light source, the reflector, the lens, and the gasket are all assembled in one securely sealed unit. If a filament burns out or a lens is broken the entire lamp unit is replaced. This assures maximum lighting efficiency throughout the life of the car.

To Replace a Reflector Unit

Remove the screw from the head lamp door (Figure 2.) and remove the door. Then remove the three screws from the lamp retaining ring and remove the ring. This allows the lamp to be pulled out far enough to remove the wire connector block and remove the lamp.

In replacing a lamp unit make sure that the three bosses on the lamp fit into the lamp housing. This lines up the lamp for correct aiming of the light. Replace the retaining ring and AIM THE HEADLIGHTS CORRECTLY.

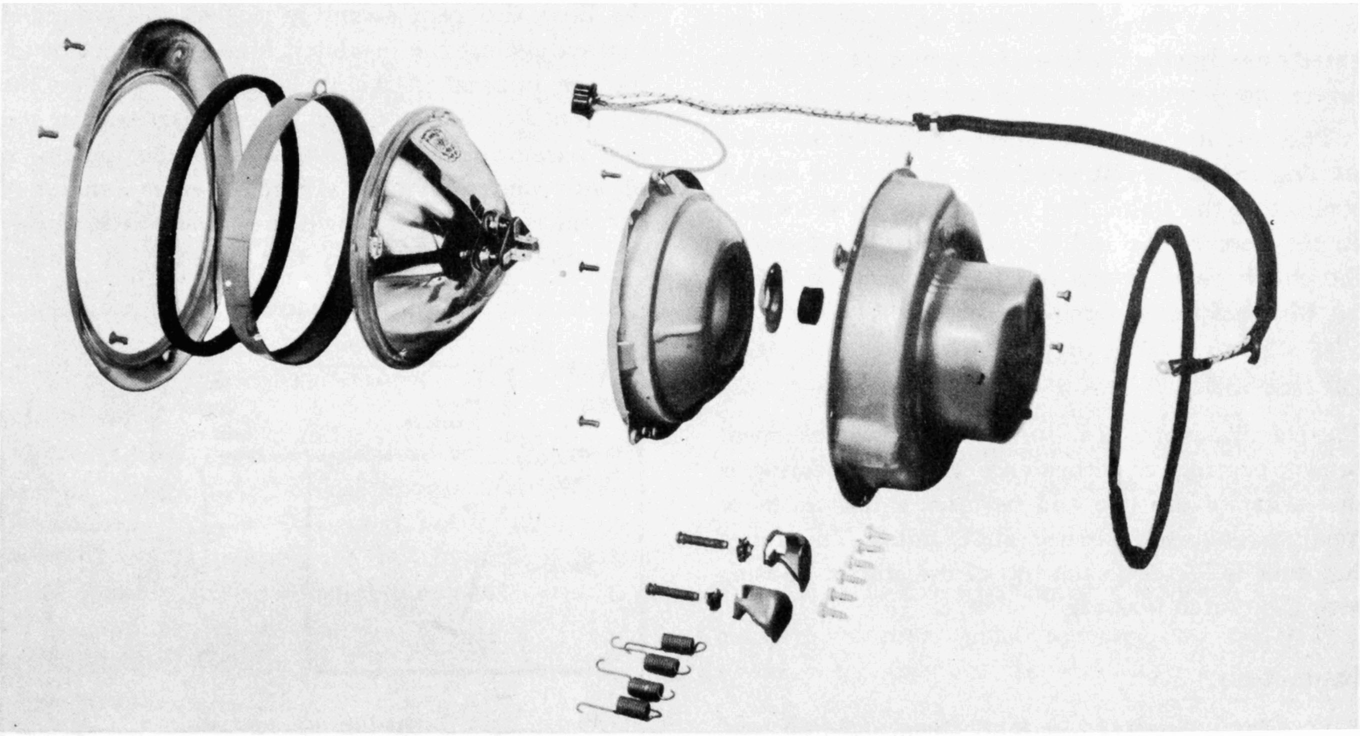


Figure 2—Sealed Beam Headlamp Assembly.

Aiming of Headlights

Locate the car on a level floor (with no passengers in the car). Have the headlight screen 25′ away from the car. Cover one lamp and then adjust the other lamp so that the zone of highest intensity centers on the intersection of a horizontal line drawn on the wall 3″ below the head lamp center and a vertical line drawn directly ahead of the lamp. Repeat this operation for the other lamp. The lamps may be adjusted by the adjusting screws found on the side of the adjusting shell. Last, replace the headlamp door.

Fuses

Fuses of 30 ampere capacity are inserted in the electrical circuit to prevent damage in the event that a ground occurs. These fuses are mounted in the fuse block located under the hood on the left front side of the body. Fuses of 20 ampere capacity are used in the overdrive relay. No change should be made in the size of fuses.

Wiring

The wiring system is a one wire grounded-type circuit and is used on all series cars. It is important that all ground connections be free from corrosion and all terminals tight. The positive terminal of the battery is grounded.

STARTING MOTOR

Description

The starting motor is a four-pole, four-brush unit with clockwise rotation at the drive end. It is flange mounted to the flywheel housing. Power is transmitted to the flywheel through an inboard-type Bendix drive. This drive clutch automatically engages the flywheel when the armature starts to rotate and disengages when the engine starts.

The starting circuit consists of the battery, the starting motor, the starting switch, and the cables connecting the units. The starting switch is located on the floor board and is contacted by depressing the clutch pedal to the full release position. Starting Motor Specifications are on page 11.

Lubrication

The starting-motor armature is carried in absorbent bronze bearings at either end. The rear bearing is the larger of the two and requires a few drops of medium engine oil every 5000 miles. The hinge cap oiler is found on the top of the starter housing near the clutch housing.

Inspection

All connections should be kept clean and tight and should be inspected periodically for voltage drop.

The starting motor should be checked for the amount of current draw under a free running test in relation to the voltage drop. See Specifications on page 11.

ELECTRIC TELEGAGES

Description

These electric gauges consist of two units — the sender unit and the receiver unit. There is one set to record the fuel level, one set for oil pressure, and one set for water temperature.

Fuel Level Gauge

Fuel Tank Empty — When the ignition switch is turned on current flows through the circuit, warms the heater wires wound around the sender and receiver bimetals, and causes them to bend. The bending of the tank unit sender bimetal opens the contact points and the circuit is broken. The heater wire then cools and the bimetal returns to its former position. (Figure 3A.) Contact is then made again. The cycle is repeated approximately once every second.

Since both heater wires are in the same circuit, a similar slight bending of the bimetal in the dash unit is produced and is sufficient to make the pointer register zero.

Fuel Tank Full — When the fuel tank is full, the float and cam assembly pushes the grounded contact against the insulated bimetal contact bending the bimetal in the tank unit. Now, when the ignition switch is on, the action described in the first paragraph occurs. But, because the bimetal is already under a strain, a much greater amount of current is required to bend the bimetal sufficiently to break the contact in this position. A similar

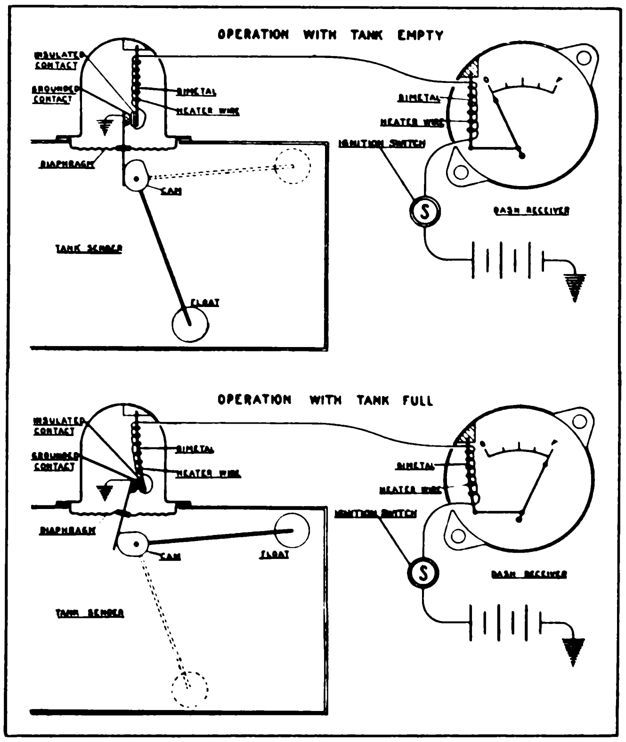

OPERATION WITH TANK EMPTY
INSULATED CONTACT
GROUNDED CONTACT
BIMETAL
HEATER WIRE
DIAPHRAGM
CAM
TANK SENDER
FLOAT
BIMETAL
HEATER WIRE
IGNITION SWITCH
S
DASH RECEIVER
OPERATION WITH TANK FULL
INSULATED CONTACT
GROUNDED CONTACT
BIMETAL
HEATER WIRE
DIAPHRAGM
CAM
FLOAT
TANK SENDER
BIMETAL
HEATER WIRE
IGNITION SWITCH
S
DASH RECEIVER

Figure 3—Fuel Level Gauge.

bending takes place in the dash unit. This action pulls the pointer over to the full point. (Figure 3B.)

The movement of the pointer in any position, caused by the make and break of the circuit, is so small that it cannot be detected.

Do not attempt to adjust or recalibrate these gauges.

Oil Pressure Gauge

In the oil pressure gauge (engine unit) there is a flexible diaphragm subjected to the engine oil pressure which moves the grounded contact, instead of the float and cam as in the fuel level gauge. Thus, the pressure against the insulated bimetal contact increases proportionately with the increase in oil pressure. Refer to page 23 of Engine Section for a change in oil pressure.

Water Temperature Gauge

In the electric temperature gauge (engine unit) the fixed grounded contact is so positioned that the bimetal, against which it presses, is bent mechanically. At low temperatures considerable heat is required to make this bimetal bend away from the grounded contact.

With the temperature of the coolant low, all of this heat must be generated electrically, and the same current flowing through the heater wire of the dash unit creates an equal amount of heat there and a resultant bending of the dash unit bimetal, causing the pointer to show a low temperature reading.

As the coolant temperature rises, the increase in heat aids in bending the engine unit bimetal. As a result, less heat is generated electrically, the resultant bending of the dash unit bimetal is less, and the pointer will be a high temperature reading.

To Check Fuel Gauge or Oil Pressure Gauge Unit

To check the operation of any dash unit use a tank unit that is known to be in good condition. Connect the tank unit in series with the dash unit, using a ground wire from the tank unit to the car frame. Turn the ignition key to the "ON" position. With the tank float in the bottom position the dash unit pointer should read ZERO. Raise the float to the top position and allow time for the instrument to react. The dash unit pointer should now read "Full." If the dash unit is operating correctly, check the sender unit on the car to see that it is grounded before replacing. If the dash unit does not operate correctly, check the wire between the two units. If the wire is OK, then replace the dash unit.

Do not attempt to adjust or recalibrate these gauges.

To Check Temperature Gauge

Disconnect the lead wire at the engine unit and connect to the terminal of an OK tank unit. Ground the tank unit to the engine and turn on the ignition switch. With the float in the bottom position the dash unit pointer should be at the extreme top or hot. Raise the float to the top position and allow it to stand in this position long enough to actuate the units. The dash unit should now be at the low reading or cold.

Do not attempt to adjust or recalibrate these gauges.

HORN EQUIPMENT

Single Horns

When single horns are used, they are used without a horn relay, but if dual horns are installed it is necessary to install a horn relay.

All cars now come equipped with dual horns and relay.

Horn Relay

The horn relay is a magnetically operated switch placed in the horn circuit and remotely controlled by the horn push button. The horn relay completes the horn circuit directly from the battery to the horn through the relay contacts. The horn push button in the steering column is used merely to operate the horn relay.

Adjustments—Contact Point Opening

Check the contact point opening and adjust if necessary by bending the armature stop. Point opening should be .015″-.030″. Disconnect relay and clean contact points with a thin, fine-cut contact file if pitted or burned.

Closing Voltage

Remove the cover from the relay and connect one lead of an accurate reading voltmeter to terminal "S" and the other lead to terminal "B". To check the closing voltage with the relay on the car it will be necessary to insert a variable resistor of 10 ohms (resistance should be capable of carrying 1 ampere) in series at the "B" terminal on the relay.

With the horn button depressed, adjust the variable resistance until the relay points close and note reading on voltmeter. The points should close between 2.3 and 3.5 volts. Adjust by bending the spring post to increase or decrease the tension on the armature. Increasing the tension increases the closing voltage and decreasing the tension decreases the closing voltage.

Adjustment for Tone of Horns

Normally the power plant of Delco-Remy Klaxon Horns will not require any adjustment, since the air gap and current adjustments are locked with locking screws and will not loosen in operation. It will often be found that where the horn is not operating in a satisfactory manner, some condition outside the horn is causing the trouble. Loose mounting, loose or damaged parts in the horn, or oxidized contact points will also be a factor in poor horn tone.

When encountering a complaint of poor horn tone, disconnect one horn so attention can be confined to one horn at a time. Check first the voltage at the horns with an accurate voltmeter as the horns are sounded. The voltage must be not less than 5.25 volts *at the horn terminals,* for proper horn operation. If the voltage is low, check for a discharged battery, undersized wire in the horn circuit, loose connections, and poor contact at the relay points.

If low voltage is not the cause of the poor tone, it may be there are loose, damaged or broken parts, which may cause a rasping tone. Check the backshell, armature, field coil and projector for looseness. A poor horn tone will be caused if the projectors are reversed on the two power plants. The short projector horn produces the high note and the long projector horn produces the low note and the projectors must not be reversed on the power plants.

Current Setting

Check the current draw of the horn with an accurate ammeter. Re-adjust if necessary.

Remove the backshell and loosen the two locking nuts (Adjusting Nut) to adjust the current. Turning the adjusting nut down decreases the current draw. Turn the adjusting nut only 1/10 turn and lock in place with the locking nut before each current reading is taken.

Burned or oxidized contact points, which will result from improper adjustment and excessive current draw, may cause a poor tone. Clean contact points with a clean, fine-cut contact file, when necessary.

Air Gap

If after the above procedure the horn tone is still not satisfactory, then check the air gap. Do not adjust the air gap until it has been determined that the cause of the trouble is not elsewhere.

Remove the backshell to make the air Gap Adjustment. Use a feeler gauge and measure the air gap between the armature and the two poles of the field coil. The gap should be uniform across the entire surface of the armature between the armature and the two poles. Adjustment is made by loosening the three air gap adjusting nuts which lock the field coil in position on the three field coil mounting studs. Raise or lower these nuts and the three nuts under the field frame to obtain the proper air gap. It should now be possible to adjust the current to secure proper tone.

Deluxe Horn Ring

The deluxe horn ring consists of a steel lower contact plate, see Fig. 3, which pivots on two points in the steering wheel hub. Arms attached to this plate are in turn attached to a metal ring below the steering wheel hub. The lower contact plate is grounded through the two pivot points.

An upper contact plate of copper is supported on three studs and is insulated by fibre bushings from the steering wheel hub. A spring loaded retainer connects the copper upper contact plate to the horn wire which runs down through the center of the steering tube.

When the ring is depressed or raised, contact is established between the copper upper contact plate and the steel lower contact plate which completes the ground circuit to the horn blowing relay to operate the horn.

No adjustment to this device should be necessary except to provide uniform air gap between the copper upper contact plate and the steel lower contact plate.

The Tenite cap over the horn blower mechanism is held in place with a die cast plate which is, in turn, held to the steering wheel hub by four screws. These four screws are removed from below to permit inspection or replacement of parts in the horn ring.

GENERATOR SPECIFICATIONS

Year Series	**4140**	**4240**	**4640**	**4740**	**4840**
Make	Delco	Delco	Auto-Lite	Auto-Lite	Auto-Lite
Model	1102684	1102684	GDZ-4806A	GDZ-4806A	GDZ-4806A
Type	Shunt	Shunt	Shunt	Shunt	Shunt
Max. Controlled Charging Rate	35 Amps	35 Amps	35 Amps	35 Amps	35 Amps
Cut-out Relay Voltage at closing	6.2-6.7	6.2-6.7	6.4-6.7	6.4-6.7	6.4-6.7
Amperes to open reverse current	4-6	4-6	4-6	4-6	4-6
Cut-out Relay Air Gap	.031″-.034″	.031″-.034″	.031″-.034″	.031″-.034″	.031″-.034″
Voltage Regulator Volts	7.2-7.4	7.2-7.4	7.2-7.4	7.2-7.4	7.2-7.4
Voltage Regulator Air Gap	.070″	.070″	.048″-.052″	.048″-.052″	.048″-.052″
Current Regulator Amperes	32-34	32-34	32-35	32-35	32-35
Current Regulator Air Gap	.080″	.080″	.048″-.052″	.048″-.052″	.048″-.052″

Year Series	**4160**	**4260**	**4660**	**4760**	**4860**
Make	Auto-Lite	Auto-Lite	Auto-Lite	Auto-Lite	Auto-Lite
Model	GDZ-4806A	GDZ-4806A	GDZ-4806A	GDZ-4806A	GDZ-4806A
Type	Shunt	Shunt	Shunt	Shunt	Shunt
Max. Controlled Charging Rate	35 Amps	35 Amps	35 Amps	35 Amps	35 Amps
Cut-out Relay Voltage at closing	6.4-6.7	6.4-6.7	6.4-6.7	6.4-6.7	6.4-6.7
Amperes to open reverse current	4-6	4-6	4-6	4-6	4-6
Cut-out Relay Air Gap	.031″-.034″	.031″-.034″	.031″-.034″	.031″-.034″	.031″-.034″
Voltage Regulator Volts	7.2-7.4	7.2-7.4	7.2-7.4	7.2-7.4	7.2-7.4
Voltage Regulator Air Gap	.048″-.052″	.048″-.052″	.048″-.052″	.048″-.052″	.048″-.052″
Current Regulator Amperes	32-35	32-35	32-35	32-35	32-35
Current Regulator Air Gap	.048″-.052″	.048″-.052″	.048″-.052″	.048″-.052″	.048″-.052″

Year Series	**4180**	**4280**			
Make	Auto-Lite	Auto-Lite			
Model	GDZ-4803	GDZ-4803			
Type	Shunt	Shunt			
Max. Controlled Charging Rate	35 Amps	35 Amps			
Cut-out Relay Voltage at closing	6.4-6.7	6.4-6.7			
Amperes to open reverse current	4-6	4-6			
Cut-out Relay Air Gap	.031″-.034″	.031″-.034″			
Voltage Regulator Volts	7.2-7.4	7.2-7.4			
Voltage Regulator Air Gap	.048″-.052″	.048″-.052″			
Current Regulator Amperes	32-35	32-35			
Current Regulator Air Gap	.048″-.052″	.048″-.052″			

DISTRIBUTOR SPECIFICATIONS

Year Series	**4140**	**4240**	**4640**	**4740**	**4840**
Make	Delco	Delco	Auto-Lite	Auto-Lite	Auto-Lite
Model	1110512	1110512	IGW4184	IGW4184A	IGC 4512
Max. Automatic Advance	10° at 1200 Dist. RPM	10° at 1200 Dist. RPM	11° at 1400 Dist. RPM	11° at 1400 Dist. RPM	11° at 1450 Dist. RPM
Max. Vacuum Advance Degrees	8½°	8½°	7½°	7½°	7½°
Vacuum in Inches + or — 1″	17″	17″	15″	15″	15″
Dwell Angle	35°	35°	35°	35°	35°
Rotation	LH	LH	LH	LH	LH
Breaker Gap	.020″	.020″	.020″	.020″	.020″
Breaker Arm Tension	17 to 21 oz.	17 to 21 oz.	17 to 20 oz.	17 to 20 oz.	17 to 20 oz.
Timing, Breaker Points Open	D.C.	D.C.	D.C.	D.C.	D.C.
Timing Mark Location Firing Order	Vibration Dampener 153624	Vibration Dampener 153624	Vibration Dampener 153624	Vibration Dampener 153624	Vibration Dampener 153624
Spark Plug Make	Auto-Lite	Auto-Lite	Auto-Lite	Auto-Lite	Auto-Lite
Model	AN 7	AN 7	A-7	A-5	A-5
Thread	14 MM	14 MM	14 MM	14 MM	14 MM
Spark Plug Gap	.025″	.025″	.025″	.025″	.025″

Year Series	**4160**	**4260**	**4660**	**4760**	**4860**
Make	Auto-Lite	Auto-Lite	Auto-Lite	Auto-Lite	Auto-Lite
Model	IGE-4024	IGS-4205	IGS-4205A	IGS-4205B*	IGS-4205B
Max. Automatic Advance	11½° at 875 Dist. RPM	9° at 900 Dist. RPM	12° at 1350 Dist. RPM	14° at 1350 Dist. RPM	14° at 1350 Dist. RPM
Max. Vacuum Advance Degrees	None	6° at Dist.	6° at Dist.	6° at Dist.	6° at Dist.
Vacuum in Inches + or — 1″	None	15″	15″	15″	15″
Dwell Angle	35°	38°	38°	38°	38°
Rotation	RH	RH	RH	RH	RH
Breaker Gap	.020″	.020″	.020″	.020″	.020″
Breaker Arm Tension	17 to 20 oz.	17 to 20 oz.	17 to 20 oz.	17 to 20 oz.	17 to 20 oz.
Timing, Breaker Points Open	6° B.T.D.C.	4° B.T.D.C.	4° B.T.D.C.	T.D.C.	T.D.C.
Timing Mark Location	Vibration Dampener	Vibration Dampener	Vibration Dampener	Vibration Dampener	Vibration Dampener
Firing Order	153624	153624	153624	153624	153624
Spark Plug Make	A.C.	A.C.	A.C.	A.C.	A.C.
Model	45	45	45	44	44
Thread	14 MM	14 MM	14 MM	14 MM	14 MM
Spark Plug Gap	.025″	.025″	.025″	.025″	.025″

*4760 Series below service serial number N6-115794 use IGS-4205A Distributor, starting with serial number NG6-165794 use Distributor IGS-4205B.

DISTRIBUTOR SPECIFICATIONS

Year Series	4180	4280	
Make	Auto-Lite	Auto-Lite	
Model	IGK4102	IGT4202	
Max. Automatic Advance	12° at 1100 Dist. RPM	12.5° at 1900 Dist. RPM	
Max. Vacuum Advance Degrees	None	6° Dist.	
Vacuum in Inches + or — 1″	None	17½″	
Dwell Angle	28°	27°	
Rotation	RH	RH	
Breaker Gap	.017″	.017″	
Breaker Arm Tension	17 to 20 oz.	17 to 20 oz.	
Timing, Breaker Points Open	9° B.T.D.C.	7° B.T.D.C.	
Timing Mark Location	Vibration Dampener	Vibration Dampener	
Firing Order	16258374	16258374	
Spark Plug Make	A.C.	A.C.	
Model	45	45	
Thread	14 MM	14 MM	
Spark Plug Gap	.025″	.025″	

STARTING MOTOR SPECIFICATIONS

Year Series	4140	4240	4640	4740	4840
Make	Delco	Delco	Auto-Lite	Auto-Lite	Auto-Lite
Model	1109451	1109451	MZ-4103	MZ-4103	MZ-4103
Lock Test Amperage Draw	540	540	560	560	560
Volts	3.3	3.3	4.0	4.0	4.0
Torque in Ft. Lbs.	11.5	11.5	11.8	11.8	11.8
No Load Test Amperage Draw	60	60	70	70	70
Volts	5.7	5.7	5.5	5.5	5.5
R.P.M.	6000	6000	4300	4300	4300

STARTING MOTOR SPECIFICATIONS

Year Series	**4160**	**4260**	**4660**	**4760**	**4860**
Make	Auto-Lite	Auto-Lite	Auto-Lite	Auto-Lite	Auto-Lite
Model	MAB-4076	MAB-4076	MAB-4076	MAB-4076	MAB-4076
Lock Test Amperage Draw	775	775	775	775	775
Volts	4	4	4	4	4
Torque in Ft. Lbs.	22.5	22.5	22.5	22.5	22.5
No Load Test Amperage Draw	60	60	60	60	60
Volts	5.5	5.5	5.5	5.5	5.5
R.P.M.	3700	3700	3700	3700	3700
Year Series	**4180**	**4280**			
Make	Auto-Lite	Auto-Lite			
Model	MAB-4104	MAB-4104			
Lock Test Amperage Draw	775	775			
Volts	4	4			
Torque in Ft. Lbs.	22.5	22.5			
No Load Test Amperage Draw	60	60			
Volts	5.5	5.5			
R.P.M.	3700	3700			

BATTERY SPECIFICATIONS

Year Series	**4140**	**4240**	**4640**	**4740**	**4840**
Make	Auto-Lite	Auto-Lite	Auto-Lite	Auto-Lite	Auto-Lite
Capacity, Amp. Hours	90 at 20 Hr. Rate	90 at 20 Hr. Rate	90 at 20 Hr. Rate	90 at 20 Hr. Rate	90 at 20 Hr. Rate
No. of Plates per Cell	13	13	13	13	13
Year Series	**4160**	**4260**	**4660**	**4760**	**4860**
Make	Auto-Lite	Auto-Lite	Auto-Lite	Auto-Lite	Auto-Lite
Capacity, Amp. Hours	105 at 20 Hr. Rate	105 at 20 Hr. Rate	105 at 20 Hr. Rate	105 at 20 Hr. Rate	105 at 20 Hr. Rate
No. of Plates per Cell	15	15	15	15	15
Year Series	**4180**	**4280**			
Make	Auto-Lite	Auto-Lite			
Capacity, Amp. Hours	120 at 20 Hr. Rate	120 at 20 Hr. Rate			
No. of Plates per Cell	17	17			

SPECIFICATIONS

4840-60 Series with Delco-Remy Equipment

GENERATOR SPECIFICATIONS—Nash Part No. 3125119

Rotation	Right hand
Brush Spring Tension	24 to 28 ounces
Field Current at 6 Volts	1.75-1.90 Amperes
Cold Output	30 Amperes at 8.0 Volts at 1750 R.P.M. (Maximum output controlled by current regulator unit)
Lubrication	10 to 20 drops of light engine oil in the oilers every 1000 miles

CURRENT AND VOLTAGE REGULATOR—Nash Part No. 3107128

Cut-out Relay	Air Gap	.020″
Cut-out Relay	Point Opening	.020″
Cut-out Relay	Closing Voltage	6.2 to 6.7 Volts Regulator at operating temperatures
Current Regulator	Air Gap	.080″
Current Regulator	Current Setting	32 to 34 Amperes
Voltage Regulator	Air Gap	.070″
Voltage Regulator	Voltage Setting	7.2 to 7.4 Volts Regulator at operating temperatures

STARTING MOTOR SPECIFICATIONS 4840 SERIES — Nash Part No. 3125317

Rotation	Right hand (Viewing Drive End)
Brush Spring Tension	24 to 28 ounces
No Load	6000 R.P.M.—60 Amperes—5.7 Volts
Lock Torque	11.5 Foot Pounds—540 Amperes—3.3 Volts

STARTING MOTOR SPECIFICATIONS 4860 SERIES—Nash Part No. 3125318

Rotation	Right hand (Viewed from End)
Brush Spring Tension	24 to 28 ounces
No Load	6000 R.P.M.—60 Amperes—3.0 Volts
Lock Torque	16 Foot Pounds—600 Amperes—5.0 Volts
Lubrication	8 to 10 drops of light engine oil in the oilers every 5000 miles

DISTRIBUTOR SPECIFICATIONS 4840 SERIES—Nash Part No. 3125315

Rotation	Left hand (Viewed from Top)
Cam Angle Dwell	35 degrees
Contact Gap	.018″ to .024″
Breaker Arm Spring Tension	17 to 21 ounces
Condenser Capacity	18 to 23 Microforads
Lubrication — **1000 Mile**	A trace of high melting point grease on the breaker cam
5000 Mile	A drop of light engine oil on breaker pivot and on the felt wick on the cam

AUTOMATIC ADVANCE (Distributor Degrees and Distributor R.P.M.)

Start	0° at 300 RPM.
Intermediate	2° at 350 RPM.

Intermediate	7°	at	800 RPM.
Intermediate	8°	at	950 RPM.
Full Advance	11°	at	1400 RPM.

VACUUM ADVANCE (Distributor and Vacuum Inches)

4° of Vacuum to Start Advance
7½° Full Advance at 15″ Vacuum

DISTRIBUTOR SPECIFICATIONS 4860 SERIES—Nash Part No. 3125316

Rotation	Right hand (Viewed from Top)
Cam Angle Dwell	35 Degrees
Contact Point Opening	.018″ to .024″
Contact Spring Tension	17 to 21 ounces
Condenser Capacity	.18 to 23 Microforads
Lubrication — **1000 Mile**	A trace of high melting point grease on the breaker cam
5000 Mile	A drop of light engine oil on breaker pivot, on wick under rotor, and three balls supporting the breaker plate

AUTOMATIC ADVANCE—(Distributor Degrees and Distributor RPM)

Start	0°	at	300 RPM.
Intermediate	2°	at	400 RPM.
Intermediate	4°	at	500 RPM.
Intermediate	6°	at	600 RPM.
Intermediate	9°	at	850 RPM.
Full Advance	14°	at	1350 RPM.

VACUUM ADVANCE—(Distributor and Vacuum Inches)

1° Advance at 6½″ Vacuum
3° Advance at 10″ Vacuum
6° Full Advance at 15″ Vacuum

FUEL SECTION

Nash

TECHNICAL MANUAL

CARBURETOR DESCRIPTION 2

CLIMATIC CONTROL 3

FUEL PUMP 3

AIR CLEANER AND SILENCER 7

41-4240 CARBURETOR SPECIFICATIONS 8

46-47-4840 CARBURETOR SPECIFICATIONS 10-12

4160 CARBURETOR SPECIFICATIONS 14

42-4660 CARBURETOR SPECIFICATIONS 15

47-4860 CARBURETOR SPECIFICATIONS 15

41-4280 CARBURETOR SPECIFICATIONS 17-19

FUEL SECTION
NASH TECHNICAL MANUAL

CARBURETOR

Description

It is the purpose of the carburetor to mix the correct amount of air with the correct amount of fuel to keep the engine running efficiently at all engine speeds and under all load conditions. To do this, it is important that the fuel tank, fuel lines, fuel pump, carburetor, and the intake manifold be functioning properly.

Carburetors require servicing periodically, adjustment and cleaning. All adjustments made should be in accordance with Carter Carburetor Specifications as outlined on pages 8 to 20.

> CAUTION: *The use of special carburetor tools is an absolute necessity when servicing a carburetor.*

Carburetor Float Level

The level of the fuel in the carburetor is a major factor in the performance of the carburetor and should be checked very carefully and held within the specified limits established for the carburetor being worked on. (Fig. 1.)

41-4240 Series

To set the float correctly in the carburetor for this Series use tool (T109-50), as shown in Fig. 1-A. Measure the distance from the top surface of the carburetor body down to the top of the float, refer to specifications on page 8.

> CAUTION: *Make sure that both ends of the float are at the same height.*

To reset this float, be sure that float lever pin is firmly seated. Bending the lip of the float away from the needle will raise the float. Bending the lip toward the needle will lower the float.

41-4260, 46-47-4840-60 Series

To set the float in the carburetor for these series engines, invert the float as shown in Fig. 1-B and measure from the upper edge of the seam on the float down to the edge of the cover casting. Use float setting tool (T-109-80, 82 or 83) as specified under float settings on pages 10, 12, 14, 18.

Float adjustment is made by bending the lip on the float that contacts the needle.

> CAUTION: *Bend the outer end of the lip. Do not put pressure on the front of the float when bending the lip of the float.*

41-4280 Series

The float setting is made on the carburetor by inverting the float casting and measuring from the top of the float (bottom when inverted) to the

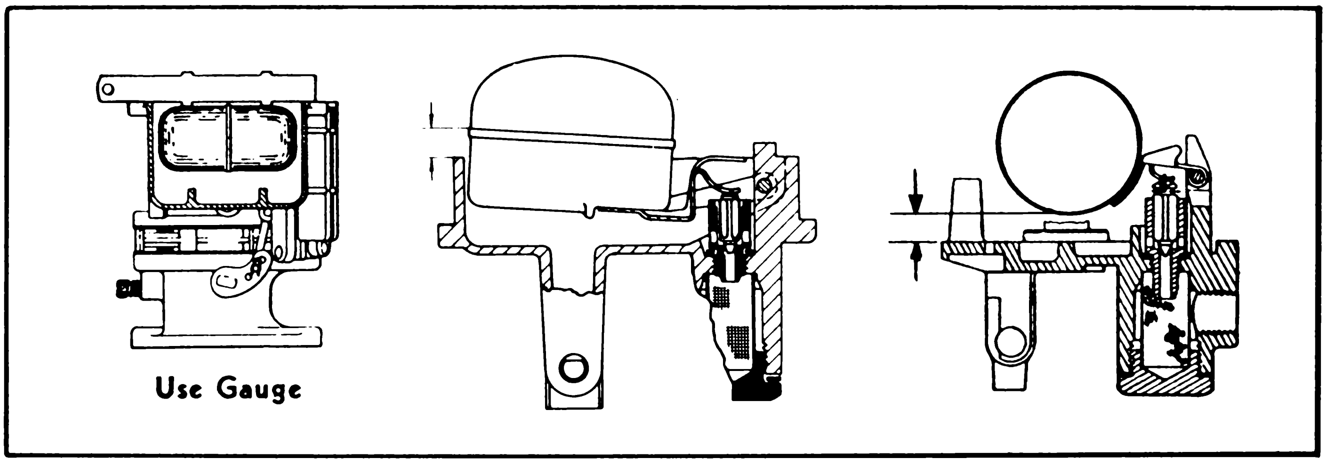


Figure 1—Correct Float Level, 40-60-80 Series Carburetors.

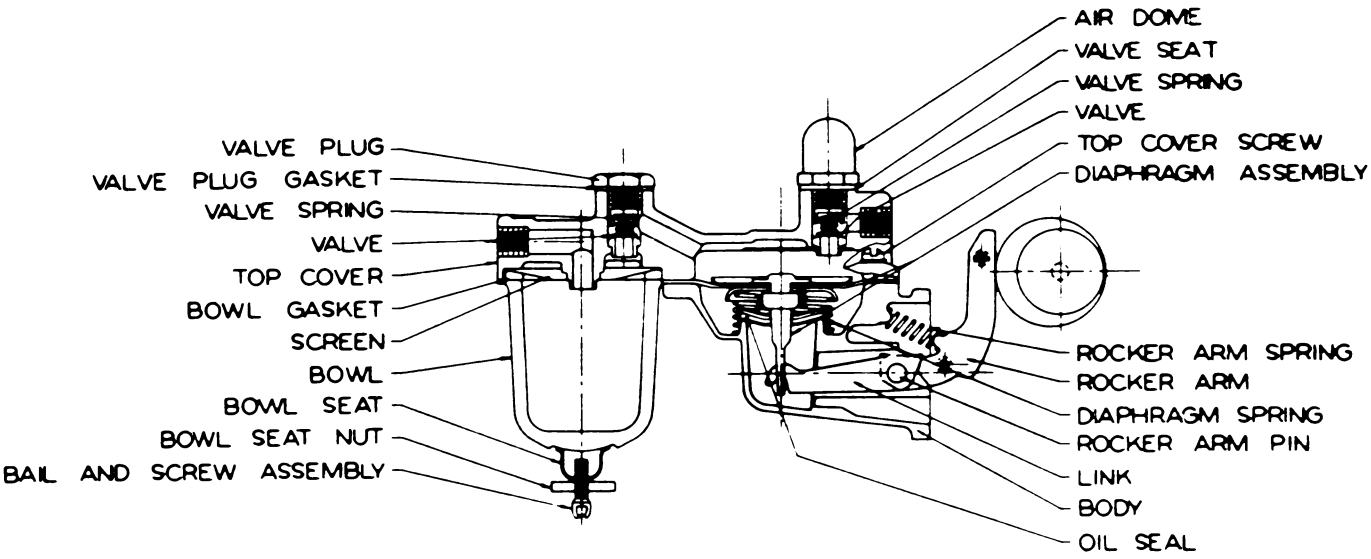

VALVE PLUG
VALVE PLUG GASKET
VALVE SPRING
VALVE
TOP COVER
BOWL GASKET
SCREEN
BOWL
BOWL SEAT
BOWL SEAT NUT
BAIL AND SCREW ASSEMBLY
AIR DOME
VALVE SEAT
VALVE SPRING
VALVE
TOP COVER SCREW
DIAPHRAGM ASSEMBLY
ROCKER ARM SPRING
ROCKER ARM
DIAPHRAGM SPRING
ROCKER ARM PIN
LINK
BODY
OIL SEAL

Figure 2—A.C. Type "W" Fuel Pump.

finished surface of the cover casting (as shown in Fig. 1-C). Use float setting tool (T-109-28) for the correct setting.

Carburetor Inspection

Carburetors should be inspected and cleaned periodically to maintain maximum engine performance. The float level setting should be adjusted in accordance with the specifications given in the specification section under the series engine being worked on.

CLIMATIC CONTROL

41-4260-80, 46-47-4840-60 Series

The climatic control is used in place of the conventional choke control operated from the dash. This device will give the correct mixture ratios at all temperatures and at all speeds.

Inspection and Adjustment

The procedure for inspecting and adjusting the climatic control will be found in the specification section under the series engine being worked on.

FUEL PUMP

Description

The fuel pump is driven from the camshaft and supplies the fuel to the carburetor. It is important that the fuel pump pressure be sufficient to supply enough fuel for high speeds but there should not be excessive pressure that will cause the carburetor needle to be forced from its seat at low engine R.P.M.

Fuel Pump Inspection

Follow the procedure outlined in the specification section under the series being worked on.

Fuel Pump Assembly

Whenever a fuel pump has to be disassembled, make sure that the pump cover and pump body are marked so that they can be reassembled in the same position for correct assembly on the engine.

AC. "W" Fuel Pump 41-42-46-47-4840 Series

This fuel pump is the standard fuel pump used without overdrive. (Fig. 2.)

AC. "AD" Fuel and Vacuum Pump 41-4260-80, 46-47-4860 Series

This fuel pump is used with overdrive and incorporates a vacuum pump in connection with the fuel pump. This vacuum pump is a booster to manifold vacuum, to assist in the operation of the windshield wipers under a load condition. (Fig. 3.)

AC. "AJ" Fuel and Vacuum Pump 41-4240 Series with Overdrive—(Fig. 4)

This fuel pump is the pump used on the 40 Series engines, where overdrive is used. It incorporates a vacuum pump for windshield wiper operation.

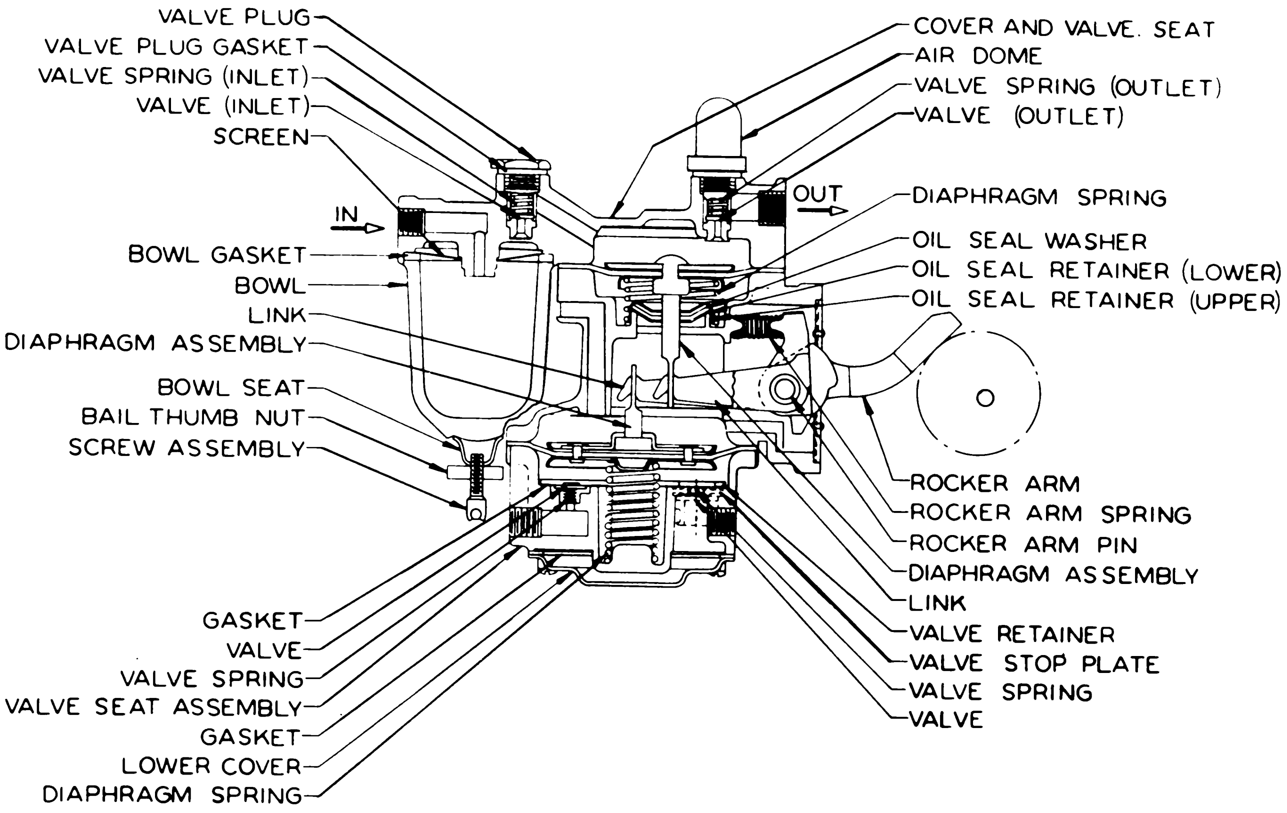

VALVE PLUG
VALVE PLUG GASKET
VALVE SPRING (INLET)
VALVE (INLET)
SCREEN
IN
BOWL GASKET
BOWL
LINK
DIAPHRAGM ASSEMBLY
BOWL SEAT
BAIL THUMB NUT
SCREW ASSEMBLY
GASKET
VALVE
VALVE SPRING
VALVE SEAT ASSEMBLY
GASKET
LOWER COVER
DIAPHRAGM SPRING
COVER AND VALVE. SEAT
AIR DOME
VALVE SPRING (OUTLET)
VALVE (OUTLET)
OUT
DIAPHRAGM SPRING
OIL SEAL WASHER
OIL SEAL RETAINER (LOWER)
OIL SEAL RETAINER (UPPER)
ROCKER ARM
ROCKER ARM SPRING
ROCKER ARM PIN
DIAPHRAGM ASSEMBLY
LINK
VALVE RETAINER
VALVE STOP PLATE
VALVE SPRING
VALVE

Figure 3—A.C. Type "AD" Fuel and Vacuum Pump.

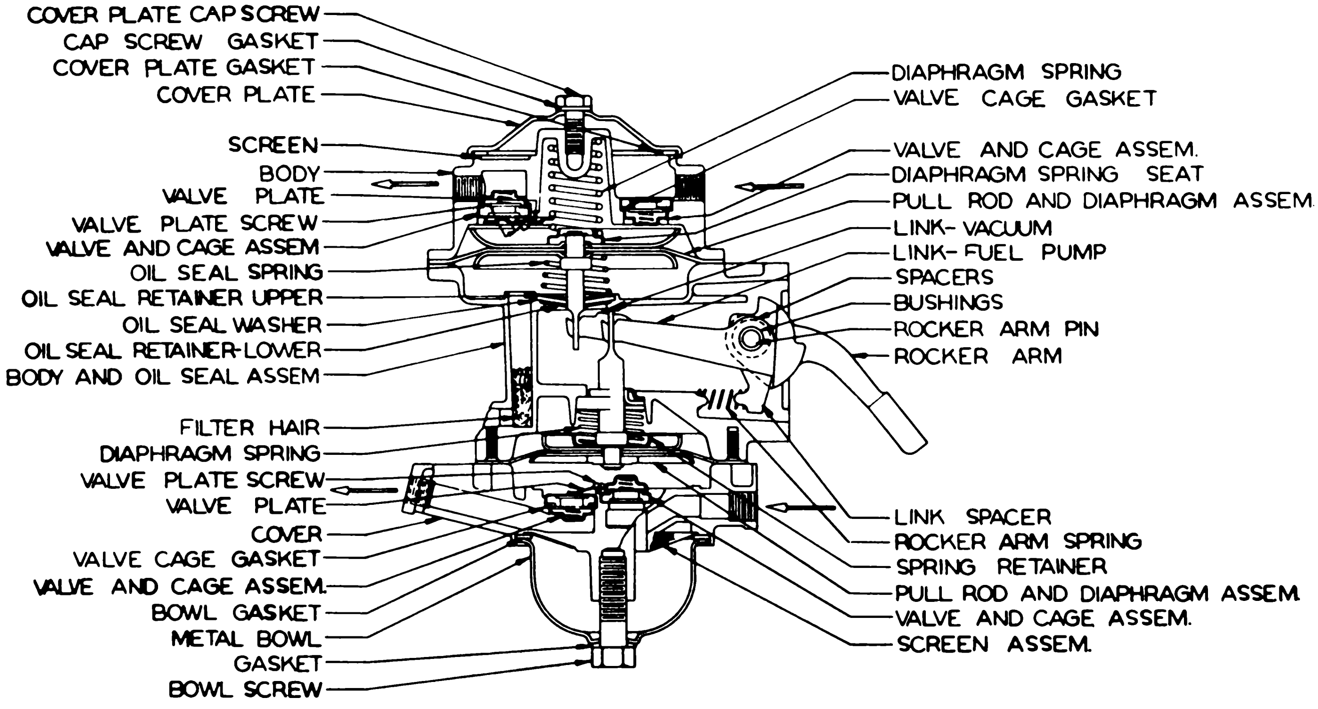

COVER PLATE CAP SCREW
CAP SCREW GASKET
COVER PLATE GASKET
COVER PLATE
SCREEN
BODY
VALVE PLATE
VALVE PLATE SCREW
VALVE AND CAGE ASSEM
OIL SEAL SPRING
OIL SEAL RETAINER UPPER
OIL SEAL WASHER
OIL SEAL RETAINER-LOWER
BODY AND OIL SEAL ASSEM
FILTER HAIR
DIAPHRAGM SPRING
VALVE PLATE SCREW
VALVE PLATE
COVER
VALVE CAGE GASKET
VALVE AND CAGE ASSEM.
BOWL GASKET
METAL BOWL
GASKET
BOWL SCREW
DIAPHRAGM SPRING
VALVE CAGE GASKET
VALVE AND CAGE ASSEM.
DIAPHRAGM SPRING SEAT
PULL ROD AND DIAPHRAGM ASSEM.
LINK- VACUUM
LINK- FUEL PUMP
SPACERS
BUSHINGS
ROCKER ARM PIN
ROCKER ARM
LINK SPACER
ROCKER ARM SPRING
SPRING RETAINER
PULL ROD AND DIAPHRAGM ASSEM.
VALVE AND CAGE ASSEM.
SCREEN ASSEM.

Figure 4—A.C. Type "AJ" Fuel and Vacuum Pump.

FUEL PUMP ASSEMBLY PROCEDURE

BODY, ROCKER ARM AND LINKS ASSEMBLY "AD"

1. Assemble rocker arm, fuel link, link spacer and vacuum links on rocker arm pin bushing in same relative position as when removed from the pump.

2. Place the hooked end of one of the vacuum links on top of the other vacuum link (this is necessary to permit assembly in body).

3. Place assembly of links, rocker arm, link spacer, and rocker arm pin bushing in body, making sure that rocker arm spring seats properly on ear of link spacer.

4. Assemble rocker arm pin in position. Place washer over end of pin, then swedge counterbored end of pin over securely against washer.

ASSEMBLING FUEL DIAPHRAGM IN PUMP "AD"

Invert body, push diaphragm assembly against the spring pressure and assemble slot in diaphragm pull rod over hooked end of fuel link.

VALVE AND COVER ASSEMBLY "W" AND "AD"

1. Blow out valve chamber and make certain that no foreign particles are present which might prevent valve from seating properly. Also observe that no burrs or irregularities exist in the valve seat and that the valve seat is securely held in place in the upper cover.

2. Place a drop of Finol on the fibre valve and put in proper position in valve chamber. Be certain that valve lies flat against the valve seat and is not standing on edge or tipped.

3. Insert valve spring on top of valve.

4. Place fibre gasket on valve plug and then place stem of valve plug around the coil spring and tighten plug securely. Be certain that the stem of the valve plug does not distort the valve spring but fits properly around it.

ASSEMBLY OF FUEL PUMP COVER ASSEMBLY TO BODY "W" AND "AD"

1. Line up screw holes in top cover with holes in diaphragm and body.

Insert and tighten screws until cover is drawn up to within 1/8" of the body, then push upward on pull rod, forcing the diaphragm to its full, highest position, then while it is in this position, tighten cover screws alternately and securely.

STRAINER ASSEMBLY "W" AND "AD"

1. Assemble strainer in pump cover. Make certain that it fits snugly around the gasoline inlet and edges of casting.

2. Place NEW strainer gasket next to strainer, then assemble glass bowl and bail.

VACUUM PUMP ASSEMBLY PROCEDURE —A.C. TYPE "AD"

The vacuum pump body is furnished with the inlet valve seat assembled.

1. Place fibre inlet valve in position on top of brass inlet valve seat in body.

2. Place inlet valve spring on top of inlet valve.

3. Place die-cast valve stop plate (spider-shaped) on top of valve spring with top coil of spring seating in recess in bottom of spider.

4. Place outlet valve spring in position, centering the coils of the spring in the round recess.

5. Press the die-cast inlet valve stop (spider-shaped) downward with finger against inlet valve spring pressure. Make certain that valve spring is properly centered in inlet valve stop, and that legs of inlet valve stop fit down into the recess in the body.

6. Place fibre outlet valve in position on top of outlet valve spring.

7. With inlet valve stop held down, slide valve retainer gasket into its proper position, continuing to hold down the inlet valve stop. Place valve retainer in position on top of gasket.

> IMPORTANT: *Be certain that valve retainer is right side up. The countersunk holes in valve retainer must face upward.*

8. Secure valve retainer in position with flat head screws, tightening center screws first and end screws last.

9. Turn vacuum pump body over and place screen in position. Screen should lie flat and fit properly around shoulders of screw holes in body.

10. Place bottom cover gasket in position on top of screen, lining up screw holes.

11. Assemble bottom cover, using four screws.

ASSEMBLY OF VACUUM PUMP UNIT TO BODY "AD"

1. Place completed assembly of body and fuel pump unit in an inverted position in bench vise.

2. Place diaphragm assembly in position making sure that slot in pull rod engages hooks on both vacuum links properly and that screw holes in diaphragm match up with screw holes in body.

3. Place diaphragm spring in position on diaphragm.

4. Lay assembled vacuum pump unit in position on body, centering the diaphragm spring around the boss in the vacuum pump body and lining up marks made before disassembling—making sure that the holes in the diaphragm match up properly with the screw holes in body flanges.

5. Press in on rocker arm holding diaphragm even with flat surface of flange on body. While it is in this position, insert and tighten body screws until vacuum pump unit is drawn down to about 1/8" from pump body, then release the rocker arm, permitting the diaphragm spring to force the diaphragm to its highest position. Then tighten screws alternately and securely.

PROCEDURE IN ASSEMBLY "W"

Body, Rocker Arm and Link Assembly "W"

1. Assemble link, rocker arm, and rocker arm spring in body. Insert rocker arm pin through hole in body, engaging link and rocker arm. Place washer over end of pin and then swedge counterbored end of pin over securely against washer.

Diaphragm and Pull Rod Assembly "W"

To correctly assemble diaphragm assembly in pump body, proceed as follows:

1. Place diaphragm spring in position in pump body.

2. Place diaphragm assembly over spring, centering upper end of spring in lower protector washer.

3. Press downward on diaphragm, and at the same time assemble slot in diaphragm pull rod over the end of the link.

FUEL PUMP ASSEMBLY PROCEDURE

> NOTE: *For repairs necessitating the removal of the fuel pump diaphragm, first remove rocker arm pin and pull out rocker arm and link assembly, then the diaphragm can be lifted straight up and out with no damage to the oil seal.*

BODY, ROCKER ARM, DIAPHRAGM AND LINK ASSEMBLY "AJ"

Assemble links, rocker arm bushing, link spacer washer, and rocker arm spring in position in body. In place of the rocker arm pin insert small end of special rocker arm assembling pin No. 1521581 through rocker arm pin hole in body, holding these parts in position then proceed as follows:

1. Place diaphragm spring in position; then assemble diaphragm pull rod through boss in body, hooking pull rod over end of link.

2. Force small end of special assembling pin on through holes in body, link, and rocker arm until the large end of pin is holding assembly together.

3. Using regular rocker arm pin, drive special assembling pin on through assembly (this leaves rocker arm pin properly assembled).

4. Place washer over counterbored end of pin; then use a center punch or some similar tool to swedge over counterbored end of pin against the washer.

> NOTE: *To remove the pin it is necessary to use a 3/8" or larger drill to drill out the counterbored end of the pin.*

VALVE AND COVER ASSEMBLY "AJ"

1. Place gaskets in position in inlet and outlet valve cage seats in fuel cover.

2. Place valve and cage assemblies in position in inlet and outlet cage seats in cover, making sure that the large diameter is placed against the gasket on the inlet side and that the small diameter is assembled into the outlet hole in the cover, permitting the shoulder of the cage to fit properly against the gasket. (THIS IS IMPORTANT.)

3. Place valve cage retainer in position with the curved end of two legs fitting snugly against each valve cage. Insert two screws and tighten securely, making sure that retainer legs are in proper position when finally tightened.

4. Place NEW cork bowl gasket in seat in cover, making sure that it fits properly in seat.

5. Assemble metal bowl in position on gasket; place small gasket around cap screw hole in bottom of bowl. Assemble screw through hole in bowl and tighten securely.

VACUUM DIAPHRAGM AND PULL ROD ASSEMBLY "AJ"

1. Place lower (small) oil seal retainer, leather oil seal washer, upper (large) oil seal retainer and oil seal retainer spring in position in the order named.

2. Engage hooked end of link in slot in diaphragm pull rod.

VACUUM PUMP ASSEMBLY PROCEDURE—"AJ"

1. Place valve cage gasket in position in inlet and outlet valve cage seats in vacuum body.

2. Place valve and cage assemblies in position in inlet and outlet cage seats, making sure that the large diameter is placed against the gasket on the inlet side and that small diameter is assembled into the outlet hole in the body, permitting the shoulder of the cage to fit properly against the cage gasket.

3. Place valve cage retainer plate in position with the curved end of two legs fitting snugly against each valve cage, insert retainer plate screw and tighten securely, making sure that retainer legs are in proper position when finally tightened.

4. Place screen, screen retainer, cover plate gasket, cover plate and cap screw gasket in proper position, then insert cover plate cap screw and tighten securely.

ASSEMBLY OF VACUUM PUMP UNIT TO FUEL PUMP "AJ"

1. Place completed assembly of fuel pump unit in position in bench vise.

2. Check to make certain that pull rod is in proper engagement with link.

3. Place diaphragm spring seat in position on diaphragm protector washer.

4. Place diaphragm spring on spring seat.

5. Lay assembled vacuum pump unit in position on fuel pump assembly, centering the heavy spring around the boss in the vacuum pump body.

6. Push down on rocker arm so that diaphragm is flat on flange, then place blade of a small screw driver or some other small piece of metal between body and shoulder on rocker arm to retain rocker arm in this position while completing assembly.

7. Line up marks on body flanges made before disassembling, press down on the vacuum pump unit, then install screws and lockwashers, thread screws carefully through layers of diaphragm cloth and tighten evenly until cover is barely tight. Remove screw driver or piece of metal from between body and rocker arm, then finish tightening cover screws.

ASSEMBLY ON ENGINE—ALL TYPES

Extreme care should be used in reassembling the pump to the engine. The cam surface of the rocker arm on "W" and "AD" pumps should rest against the TOP of the eccentric and NOT under it. On "AJ" pumps, the cam surface of the rocker arm should rest UNDER the eccentric and NOT on top of it. Failure to carefully observe the above will result in the rocker arm being broken.

Place mounting gasket in position on the mounting flange and then reinstall the pump on the engine. To check the performance of the vacuum pump unit, open the windshield wiper valve and observe the performance while alternately idling and accelerating the motor. The operation of the windshield wiper should be reasonably constant, regardless of engine speed.

GUM IN GASOLINE AND STICKING VALVES

There have been some reports in the field of fuel pump operation being impaired due to a gum-like substance forming on the valves and making it impossible to operate properly. Investigation has shown that this gum is contained in some fuels, particularly in cheaper so-called cut-rate brands. When this trouble is encountered in connection with the fuel pump, it is necessary to clean and polish thoroughly the pump valves, valve seats, and gas strainer parts to insure correct operation of the pump. It is possible that the trouble will be overcome with a different grade of gasoline.

AIR CLEANER AND SILENCER

Description

The dirt and dust in the intake air adhere to the oily copper mesh surfaces of the filter element in the cover assembly (Fig. 5). The lower part of the

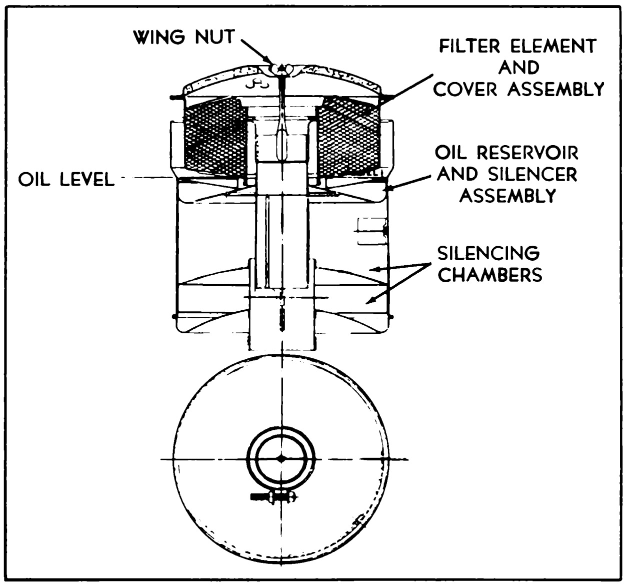

WING NUT
FILTER ELEMENT AND COVER ASSEMBLY
OIL LEVEL
OIL RESERVOIR AND SILENCER ASSEMBLY
SILENCING CHAMBERS

Figure 5—Oil Bath Air Cleaner and Silencer.

assembly is a resonant-type silencer for eliminating noise that comes through the carburetor.

Service Instructions Oil Bath Air Cleaner

Every 5000 miles the air cleaner should be cleaned and refilled with clean oil.

1. Remove the wing bolt or wing nut and the cover.
2. Remove the filter element.
3. Wash the filtering element by plunging up and down several times in a pail of kerosene. (Drain thoroughly before re-assembling.)
4. Clean out the oil base and refill to the indicated level with clean oil. (1 pint S.A.E. No. 50 for summer driving conditions—S.A.E. No. 20 for winter conditions.)
5. Re-assemble and install on the carburetor.

CARBURETOR SPECIFICATIONS

Series	Car Serial Number	Engine Serial Number
4140	K-5001 and Higher	K-5001 and Higher
4240	K-56001 and Higher	K-56001 and Higher

B-B Down-Draft Carburetor Model 513S

Six Cylinder Engine: Bore 3⅛", Stroke 3¾"

Dimensions: Flange size 1¼ inch S.A.E.
Throttle bore, 1 7/16 inch (36.51 mm).
Main venturi, 1¼ inch (31.75 mm) I.D.

Float Setting: Top of float 5/64 inch (1.98 mm) below top of surface of carburetor body casting. Plus or minus 1/64 inch (.397 mm). (Fig. 1-A.)

Vents: Outside, none. Inside, balance vent .218 inch (5.54 mm) dia.

Gasoline Intake Needle: Triangular, horizontal. No. 44 (2.18 mm) drill in needle seat.

Idle Orifice Tube: Jet size, .0276 inch (.70 mm) diameter. Idle passage air bleed (in body), size .067 inch (1.70 mm) diameter. Economizer in body, size .051 to .052 inch (1.30 to 1.32 mm) diameter.

Idle Ports: Upper port, keyhole type: length, .160 inch (4.06 mm); width, .030 inch (.76 mm); .045 inch (1.14 mm) diameter hole at top. Top of port located .118 to .122 inch (3.00 to 3.10 mm) above top edge of valve.

Lower port size, .053 to .057 inch (1.35 to 1.45 mm) diameter. (For idle adjustment screw.)

Set Idle Adjustment Screw: ½ to 1¼ turns open. For richer mixture, turn screw out. Do not idle engine below 300 r.p.m. or 6 miles per hour.

Main Metering Jet: Calibrated to flow 258 to 262 cc per minute. (Do not gauge for size. If in doubt, replace with new part.)

Main Vent: Through diffuser (air bleed inside bowl) size .0315 inch (.80 mm) drill.

Main Vent Tube: Side Holes:
2—.0354 inch (.90 mm) drill—5/16 inch (7.94 mm) from end.

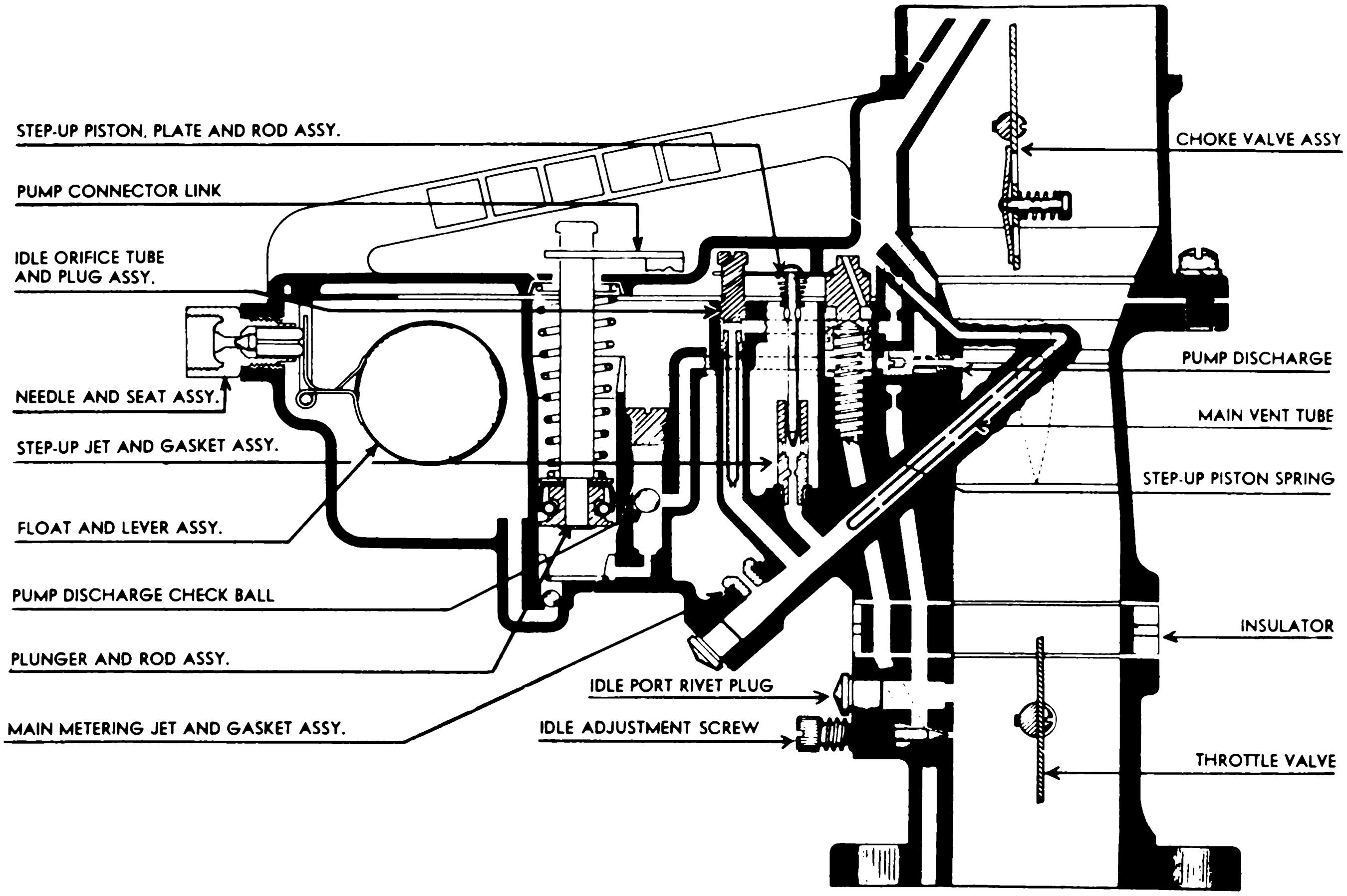

STEP-UP PISTON, PLATE AND ROD ASSY.
PUMP CONNECTOR LINK
IDLE ORIFICE TUBE AND PLUG ASSY.
NEEDLE AND SEAT ASSY.
STEP-UP JET AND GASKET ASSY.
FLOAT AND LEVER ASSY.
PUMP DISCHARGE CHECK BALL
PLUNGER AND ROD ASSY.
MAIN METERING JET AND GASKET ASSY.
IDLE PORT RIVET PLUG
IDLE ADJUSTMENT SCREW
CHOKE VALVE ASSY
PUMP DISCHARGE
MAIN VENT TUBE
STEP-UP PISTON SPRING
INSULATOR
THROTTLE VALVE

Figure 6—41-4240 Series Carburetor.

2—.0354 inch (.90 mm) drill—1 inch (25.40 mm) from end.

2—.0354 inch (.90 mm) drill—1½ inch (38.10 mm) from end.

Step-up Jet: Size, .0374 inch (.95 mm) diameter.

Accelerating Pump: Type, delayed action. Stroke: Summer setting (inner hole, short stroke). Intermediate setting (center hole). Winter setting (outer hole, long stroke). Pump intake passage, ball check seat, size .115 to .120 inch (2.93 to 3.05 mm) diameter in body.

Pump discharge passage: Restriction (under ball check), size .062 to .065 inch (1.58 to 1.65 mm) diameter in body. Pump (discharge) jet, size .0275 inch (.70 mm) drill.

Pump Adjustment: 30/64 inch (11.91 mm) plunger travel (long stroke).

Use gauge T109-117S.

Choke: Manual — Butterfly type, with pressure relief poppet valve. Inter-connected to open throttle valve to fast idle position when choke is used.

Vacuum Spark Port: Slot (round end) type: size, .040 to .110 inch (1.016 to 2.794 mm). Bottom of port to be .022 to .028 inch (.559 to .711 mm) above top edge of valve.

CARBURETOR ADJUSTMENTS

If carburetor loads up after considerable service, check float level. Wear on lip of float lever will raise float level. Before adjusting float, be sure float lever pin is firmly seated. Reset float level by bending lip of float lever away from needle to raise level, or bend lip toward needle to lower float level. Bend vertical lip of float only.

If motor stalls while idling, set throttle lever adjusting screw so motor runs approximately 300 r.p.m. Then set idle adjustment screw to specifications. If these adjustments do not correct the trouble, remove idle orifice tube and plug assembly. Clean tube and passages with compressed air.

If acceleration is not satisfactory, remove pump jet and clean with compressed air. However, it is usually advisable to replace the pump jet, as its cost is nominal. All jets must be seated gasoline tight. Poor acceleration may be due to damaged or worn plunger leather in accelerating pump, sediment in pump cylinder or clogged intake ball check at bottom of pump cylinder and discharge ball check in discharge passage. If plunger is removed from cylinder, use care in installing to avoid damage to plunger leather.

Excessive richness above 50 miles per hour may be caused by clogged main vent tube. After removal of rivet plug beneath float bowl with tool No. T109-42, main vent tube can be removed with T109-70 and a new tube inserted with tool No. T109-151. Care must be exercised in inserting new tube which must seat tightly. Use new rivet to complete the installation.

Pump Adjustment

Remove air horn assembly, back out throttle adjustment screw, and place pump operating link in lower (long stroke) hole of throttle shaft arm. (Use T109-117S gauge.) Rest base of gauge on tool T109-22 placed across machined surface of body. Adjustment can be made by bending horizontal portion of pump connector link, so that top of pump plunger shaft contacts lip of indicator on pump stroke gauge. Correct travel is 30/64".

Pump stroke adjustable for high or low temperature. Set to longest stroke for cold weather, shorter stroke for hot weather driving.

Maximum economy and performance are secured only when breaker points, spark plugs, valves and motor timing are set to manufacturer's specifications. After motor is properly tuned, the following should also be done to insure satisfactory performance and economy:

(a) Float level must be set as above.

(b) Step-up rod in step-up jet must seat and move freely. When reassembling, jet must be screwed in tight against seat.

(c) Step-up piston in body casting should not bind and must be free of dirt.

(d) Main metering jet can be replaced with leaner than standard metering jets, for altitude or high test fuel.

CAUTON: *Do not attempt to gauge metering jets with drills. These jets have been flow-tested, to insure correct fuel flow.*

CARBURETOR SPECIFICATIONS

Series	Serial Number Car	Engine Serial Number
4640	K-77701 & Higher	K-77701 & Higher
4740	K-136001 & Higher	KE-136001 & Higher

WA-1 Down-Draft Carburetor 611S with Climatic Control

6 Cylinder Engine, 3⅛" Bore, 3¾" Stroke

Dimensions: Flange size, 1¼ inch S.A.E.
Primary venturi, 11/32 inch I.D.
Secondary venturi, 11/16 inch I.D.
Main venturi, 1¼ inch I.D.

Float Level: Distance from seam of float (at free end) to tip on lower edge of float chamber cover to be ½ inch when needle is seated. (Fig. 1-B.)

Outside Vent: No. 10 drill size. No inside vent.

Gasoline Intake: Square vertical needle. No. 48 drill size in needle seat.

Gasoline Line Connection: 5/16 inch fitting.

Low Speed Jet Tube: Jet No. 71 drill size.
By-pass in body, 53 drill size.
Economizer in body, .0755-.0765 inch diameter.
Idle bleed, No. 50 drill size.

Idle Port: Upper port .086 inch diameter.
Lower port .055 inch diameter.

Idle Port Opening: Top of lower port .011 to .015 inch above top edge of valve with valve closed tight.

CARBURETOR SPECIFICATIONS

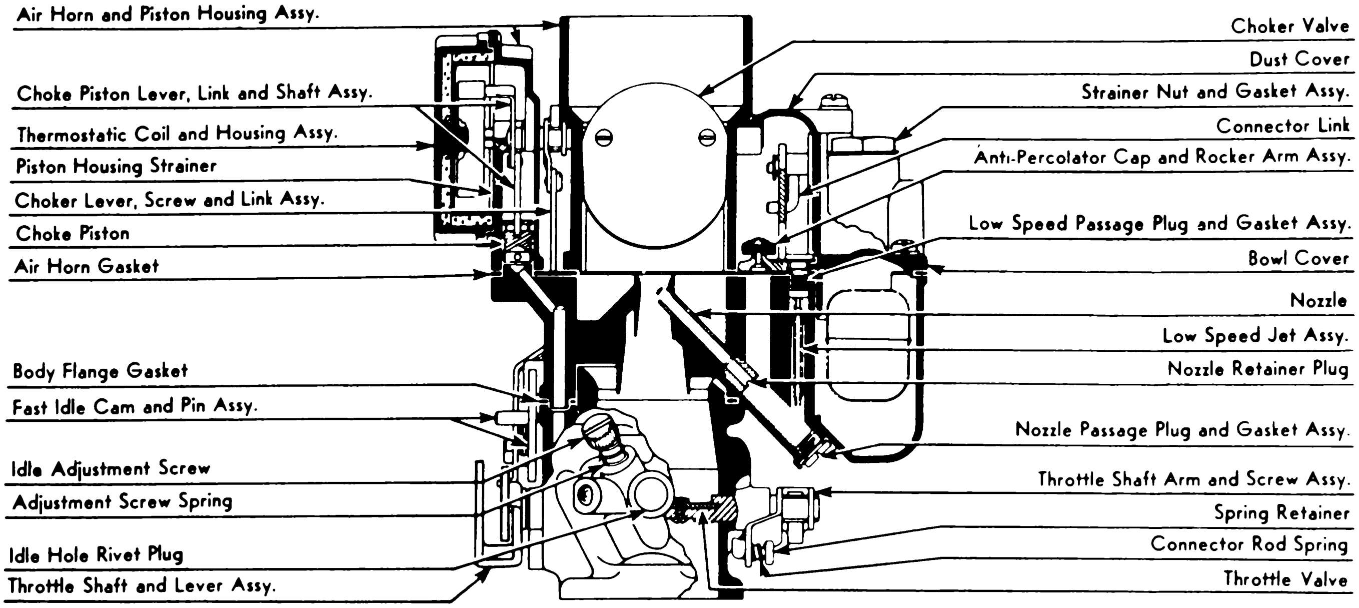

Air Horn and Piston Housing Assy.
Choke Piston Lever, Link and Shaft Assy.
Thermostatic Coil and Housing Assy.
Piston Housing Strainer
Choker Lever, Screw and Link Assy.
Choke Piston
Air Horn Gasket
Body Flange Gasket
Fast Idle Cam and Pin Assy.
Idle Adjustment Screw
Adjustment Screw Spring
Idle Hole Rivet Plug
Throttle Shaft and Lever Assy.
Choker Valve
Dust Cover
Strainer Nut and Gasket Assy.
Connector Link
Anti-Percolator Cap and Rocker Arm Assy.
Low Speed Passage Plug and Gasket Assy.
Bowl Cover
Nozzle
Low Speed Jet Assy.
Nozzle Retainer Plug
Nozzle Passage Plug and Gasket Assy.
Throttle Shaft Arm and Screw Assy.
Spring Retainer
Connector Rod Spring
Throttle Valve

Figure 7—41-4260, 46-47-4840-60 Series Carburetor with Climatic Control.

Idle Screw Seat: No. 46 drill.

Set Idle Adjustment Screw: 1¼ to 2¼ turns open. For richer mixture, turn screw out. Do not attempt to idle engine below 350 r.p.m. or 7 m.p.h.

Main Nozzle: In primary venturi, angle 45°. Closed tip. Top hole .021 inch diameter on 45° angle. Lower hole .076 inch diameter on 70° angle.

Metering Rod: Economy step, .0775 inch diameter. Middle step tapers to .0715 inch diameter. Power step, .049 inch diameter. Length of rod, $3\frac{9}{64}$ inches.

Metering Rod Jet: .096 inch diameter.

Metering Rod Setting: Use gauge, part No. T109-102 (2.468 inches).

Accelerating Pump: Low pressure type, with seasonal adjustment. Summer setting (lower hole, short stroke). Intermediate setting (upper hole). Winter setting (outer hole, long stroke). Discharge jet, No. 70 drill size. Intake ball check seat size, No. 40 drill in body. Discharge ball check, seat size, No. 32 drill in body. Relief passage to outside, No. 42 drill size.

Pump Adjustment: 25/64 inch plunger travel. (Full throttle position.) Use gauge T109-117S.

Choke: Carter Climatic Control, set 2 points lean. Butterfly type, offset valve. Choke heat suction hole, in body. Size No. 42 (.0935) drill.

Vacuum Spark Port: .039 to .041 inch diameter. Bottom of port .021 to .029 inch above valve.

CARBURETOR ADJUSTMENTS

Pump Adjustment

With throttle valve seated and connector link in outer hole of pump arm, pump plunger should travel 25/64" from seated to wide open position. Adjustment should be made by bending throttle connector rod at lower angle. Pump travel can be measured by using universal pump stroke gauge T-109-117S, placing base of gauge on ridged portion of bowl cover so that indicator ear of pump gauge rests on top surface of connector link where it extends through plunger shaft. Hold gauge vertical. The difference between the number shown by index mark on gauge, at wide open and closed positions, should be "25." Link position may be changed to accommodate climatic conditions after adjustment has been made.

Metering Rod Adjustment

Correct setting of metering rod is important and must be made after pump adjustment. Procedure is as follows:

(1) Back out throttle lever set screw to seat throttle valve.

(2) Insert metering rod gauge T-109-102 in place of metering rod, seating tapered end in metering rod jet.

(3) Press lightly on vacuum piston link until lip contacts pin on pump operating lever. There should be less than .005″ between metering rod pin and shoulder in notch of gauge.

(4) Adjustment can be made by bending lip of vacuum piston link.

Remove gauge and install metering rod and disk. Connect metering rod spring.

Anti-Percolator Adjustment

Crack throttle valve .030″ by placing gauge T-109-29 between valve and bore of carburetor (side opposite port). Bend rocker arm (Use tool T109-105) until there is a clearance of .005″ to .015″ between rocker arm and pump arm.

Fast Idle Adjustment

With fast idle cam held in normal idle position, tighten throttle lever adjusting screw until it just touches cam. Hold throttle closed and pull cam back until first (or lower) step on cam is against (not on) set screw.

There should now be ⅝″ clearance between inside wall of air horn and lower edge of choke valve. (Use tool T109-85.)

Adjustment can be made by bending at offset portion of fast idle link. (Use tool T109-41.)

Unloader Adjustment

With throttle valve wide open there should be 7/16″ clearance between lower edge of choke valve and inner wall of air horn. (Use gauge T109-81.) Adjustment should be made by bending arm on throttle lever using tool T109-41.

Lock-Out Adjustment

With throttle and choke valves wide open, choke should lock in wide open position. Adjustment should be made by bending lip at lower end of fast idle link to give 1/32″ clearance between lip and throttle lever lock.

CARBURETOR SPECIFICATIONS

Series	Car Serial Number	Engine Serial Number
4840	K-196900 & Higher	K.E.-55001 & Higher

WA-1 Down-Draft Carburetors 662S-662SA with Climatic Control

6 Cylinder Engine: 3⅛″ Bore, 3¾″ Stroke

Dimensions: Flange size, 1¼ inch S.A.E.
Primary venturi, 11/32 inch I.D.
Secondary venturi, 11/16 inch I.D.
Main venturi, 1¼ inch I.D.

Float Level: Distance from seam of float (at free end) to tip on lower edge of float chamber cover to be ½ inch when needle is seated. (Fig. 1-B.)

Outside Vent: No. 10 drill size. No inside vent.

Gasoline Intake: Square vertical needle. No. 48 drill size in needle seat.

Gasoline Line Connection: 5/16 inch fitting.

Low Speed Jet Tube: (662S) Jet No. 68 drill size, (662SA) No. 67 drill size.
By-pass in body, 53 drill size.
Economizer in body, .0755-.0765 inch diameter.
Idle Bleed, No. 50 drill size.

Idle Port: Slot type, length, .200 inch; width .032 inch.

Idle Port Opening: Top of port .153 to .157 inch above top edge of valve with valve closed tight.

Idle Screw Seat: No. 46 drill.

Set Idle Adjustment Screw: ¾ to 1¾ turns open. For richer mixture, turn screw out. Do not attempt to idle engine below 350 r.p.m. or 7 m.p.h.

Main Nozzle: In primary venturi, angle 45°. Angled tip.
Inside diameter, No. 30 drill.
Discharge jet size, .086 inch diameter.

Metering Rod: Economy step, .077 inch diameter. Middle step tapers to .070 inch diameter. Power step, .040 inch diameter. Length of rod, 3 9/64 inches.

Metering Rod Jet: .103 inch diameter.

Metering Rod Setting: Use gauge, part No. T109-102 (2.468 inches).

Accelerating Pump: High pressure type spring operated lever, with adjustable stroke.
Discharge jet, (No. 72 drill) .025 inch diameter.
Intake ball check, seat size, No. 40 drill in body.
Discharge ball check, seat size, No. 32 drill in body.
Relief passage to outside, No. 42 drill size.

Pump Adjustment: 25/64 inch plunger travel. Top hole, (center stroke). (Full throttle position.) Use gauge T109-117S.

Choke: Carter Climatic Control, (662S) set 2 points lean, (662SA) set on index. Butterfly type, offset valve. Choke heat suction hole, in body. Size No. 42 (.0395) drill.

Vacuum Spark Port: .039 to .041 inch diameter. Bottom of port .021 to .029 inch above valve.

CARBURETOR ADJUSTMENTS

Pump Adjustment

With pump connector link in outer hole of pump arm, and throttle adjustment screw backed out until throttle valve seats in bore of carburetor, pump travel should be 25/64″ from seated to wide open position. Pump travel can be measured by using universal pump stroke gauge T109-117S, by placing gauge on ridged portion of bowl cover. Hold gauge vertical. Adjust gauge until indicator ear contacts top surface of connector link where it extends through plunger shaft. Repeat at wide open throttle. The difference between the number shown by index mark on gauge, at wide open and closed positions, should be "25." Adjustment should be made by bending throttle connector rod at lower angle. Link position may be changed to accommodate climatic or seasonal conditions after adjustment has been made.

Metering Rod Adjustment

Correct setting of metering rod is important and must be made after pump adjustment. Procedure is as follows:

(1) Back out throttle lever set screw until throttle valve seats.

(2) Insert metering rod gauge T109-102 in place of metering rod, seating tapered end in metering rod jet.

(3) Press lightly on vacuum piston link until lip contacts pin on pump operating lever. There should be less than .005″ between metering rod pin and shoulder in notch of gauge.

(4) Adjust by bending lip on vacuum piston link.

Remove gauge and install metering rod and disk. Connect metering rod spring.

Anti-Percolator Adjustment

Crack throttle valve .030″ by placing gauge T109-29 between valve and bore of carburetor (side opposite port). Bend rocker arm (Use tool T109-105) until there is a clearance of .005″ to .015″ between rocker arm and pump arm.

Fast Idle Adjustment

With fast idle cam held in normal idle position, tighten throttle lever adjusting screw until it just touches cam. Hold throttle closed and pull cam back until first (or lower) step on cam is against (not on) set screw.

There should now be 5/8″ clearance between inside wall of air horn and lower edge of choke valve. (Use tool T109-85.) Adjustment can be made by bending at offset portion of fast idle link. (Use tool T109-41.)

Unloader Adjustment

With throttle valve wide open there should be 7/16″ clearance between lower edge of choke valve and inner wall of air horn. (Use gauge T109-81.) Adjustment should be made by bending arm on throttle lever with tool T109-41.

Lock-Out Adjustment

With throttle and choke valves wide open, choke should lock in wide open position. With throttle held wide open, push choke valve to wide open position. Choke should lock wide open. Adjustment should be made by bending lip at lower end of fast idle link.

CARBURETOR SPECIFICATIONS

Series	Car Serial Number	Engine Serial Number
4160	R-353001 & Higher	R-353001 & Higher

WA-1 Down-Draft Carburetor 435S with Climatic Control

6 Cylinder Engine, 3⅜" Bore, 4⅜" Stroke

Dimensions: Flange size, 1¼ inch S.A.E.
Primary venturi, 11/32 inch I.D.
Secondary venturi, 11/16 inch I.D.
Main venturi, 1 5/16 inch I.D.

Float Level: Distance from seam of float (at free end) to tip on lower edge of float chamber cover when needle is seated to be ⅜ inch. (Fig. 1-B.)

Outside Vent: No. 10 drill size (2 holes). No inside vent.

Gasoline Intake: Square vertical needle. No. 46 drill size in needle seat.

Gasoline Line Connection: 5/16 inch fitting.

Low Speed Jet Tube: Jet No. 65 drill size.
By-pass in body, 53 drill size.
Economizer in body, .059-.060 inch diameter.
Idle bleed, No. 52 drill size.

Idle Port: Length, .175 inch. Width, .030 inch.

Idle Port Opening: .137 to .141 inch with valve closed tight.

Idle Screw Seat: No. 46 drill.

Set Idle Adjustment Screw: ¾ to 1½ turns open. For richer mixture, turn screw out. Do not attempt to idle engine below 350 r.p.m. or 7 m.p.h.

Main Nozzle: In primary venturi, angle 45°. Closed tip. Top hole No. 75 drill on 45° angle. Lower hole No. 49 drill on 70° angle.

Metering Rod: Economy step, .076 inch diameter. Middle step tapers to .074 inch diameter. Power step, .040 inch diameter. Length of rod, 3 9/64 inches.

Metering Rod Jet: .0995 inch diameter.

Metering Rod Setting: Use gauge, part No. T109-102 (2.468 inches).

Accelerating Pump: Low pressure type, with adjustable stroke.
Discharge jet, No. 70 drill.
Intake ball check seat size, No. 62 drill in body.
Discharge ball check, No. 32 drill size in body.
Relief passage to outside, No. 42 drill size.

Pump Adjustment: 27/64 inch plunger travel (long stroke). Use gauge T109-117S.

Choke: Climatic Control, set 1 point rich. Butterfly type, offset valve.
Choke Heat Suction Hole, in body, size No. 37 (.104") drill.

Vacuum Spark Port: None.

CARBURETOR ADJUSTMENTS

Pump Adjustments

With throttle valve seated and connector link in upper hole in pump arm, pump plunger should travel 27/64" from closed to wide open position. Adjustment should be made by bending throttle connector rod at lower angle. Pump travel can be measured by using universal pump stroke gauge T109-117S by placing base of gauge on ridged portion of bowl cover so that indicator ear of pump gauge rests on top surface of connector link at pump shaft. Hold gauge vertical. The difference between the number shown by index mark on gauge, at wide open and closed positions, should be "27".

Metering Rod Adjustment

Correct setting of metering rod is important and must be made after pump adjustment. Insert gauge (Tool No. T109-102) in place of metering rod, seating tapered end in metering rod jet. Hold gauge vertical to insure seating. With throttle valve seated there should be less than .005" clearance between pin in pump arm and shoulder of notch in gauge.

Gauge should not drag on pin. Adjustment should be made by bending metering rod pin portion of pump arm up or down.

Remove gauge, and install metering rod and disk. Connect metering rod spring.

Anti-Percolator Adjustment

Crack throttle valve .020″ by placing gauge T109-29 between valve and bore of carburetor (side opposite port). Bend rocker arm (Use tool T109-105) until there is a clearance of .005″ to .015″ between rocker arm and pump arm.

Fast Idle Adjustment

With fast idle cam held in normal idle position, tighten throttle lever adjusting screw until it just seats against cam. Hold throttle lever closed and pull cam back until first (or lower) step on cam is against (not on) set screw.

There should now be ⅝″ clearance between inside wall of air horn and lower edge of choke valve. (Use tool T109-85.) Adjustment can be made by bending at offset portion of fast idle link. (Use tool T109-41.)

Unloader Adjustment

With throttle valve wide open there should be 31/64″ clearance between lower edge of choke valve and inner wall of air horn. (Use tool T109-82.) Adjustment should be made by bending cam on throttle lever. (Use tool T109-41.)

Lock-Out Adjustment

With throttle and choke valves wide open, choke should lock in wide open position. Adjustment should be made by bending lip at lower end of fast idle link to give 1/32″ clearance between lip and throttle lever lock, with throttle and choke valves held wide open. (Use tool T109-105.)

CARBURETOR SPECIFICATIONS

Series	Car Serial Number	Engine Serial Number
4260	R-384001 and Higher	R-384001 and Higher
4660	R-384001 and Higher	R-384001 and Higher
4760	R-384001 and Higher	RE-384001 and Higher
4860	R-384001 and Higher	RE-384001 and Higher

WA-1 Down-Draft Carburetor 464S with Climatic Control

6 Cylinder Engine, 3⅜″ Bore, 4⅜″ Stroke

Dimensions: Flange size, 1¼ inch S.A.E.
Primary venturi, 11/32 inch I.D.
Secondary venturi, 11/16 inch I.D.
Main venturi, 1 5/16 inch I.D.

Float Level: Distance from seam of float (at free end) to tip on lower edge of float chamber cover to be ⅜ inch when needle is seated. (Fig. 1-B.)

Outside Vent: No. 10 drill size (2 holes). No inside vent.

Gasoline Intake: Square vertical needle. No. 46 drill size in needle seat.

Gasoline Line Connection: 5/16 inch fitting.

Low Speed Jet Tube: Jet No. 65 drill size.
By-pass in body, 53 drill size.
Economizer in body, .059-.060 inch diameter.
Idle bleed, No. 52 drill size.

Idle Port: Length, .175 inch. Width, .030 inch.

Idle Port Opening: .137 to .141 inch above upper edge of valve with valve closed tight.

Idle Screw Seat: No. 46 drill.

Vacuum Spark Port: .061 to .064 inch diameter.
Bottom of port .022 to .027 inch above valve.

Set Idle Adjustment Screw: ½ to 1½ turns open. For richer mixture, turn screw out. Do not attempt to idle engine below 350 r.p.m. or 7 m.p.h.

Main Nozzle: In primary venturi, angle 45°. Closed tip. Top hole No. 75 drill on 45° angle. Lower hole No. 47 drill on 70° angle.

Metering Rod—Standard: Economy step, .076 inch diameter. Power step, .040 inch diameter. Length of rod, 3 9/64 inches.

Metering Rod Jet: .0995 inch diameter.

Metering Rod Setting: Use gauge, part No. T109-102 (2.468 inches).

Accelerating Pump: Low pressure type, with adjustable stroke.
Discharge jet, No. 70 drill.
Intake ball check seat size, No. 62 drill in body.
Discharge ball check, seat size, No. 32 drill in body.
Relief passage to outside, No. 42 drill size.

Pump Adjustment: 27/64 inch plunger travel (long stroke). Use gauge T109-117S.

Choke: Carter Climatic Control, set at index. Butterfly type, offset valve. Choke heat suction hole, in body, size No. 37 (.104″) drill.

CARBURETOR ADJUSTMENTS

Pump Adjustments

With throttle valve seated and connector link in upper hole in pump arm, pump plunger should travel 27/64″ from closed to wide open position. Adjustment should be made by bending throttle connector rod at lower angle. Pump travel can be measured by using universal pump stroke gauge T109-117S by placing base of gauge on ridged portion of bowl cover so that indicator ear of pump gauge rests on top surface of connector link at pump shaft. Hold gauge vertical. The difference between the number shown by index mark on gauge, at wide open and closed positions, should be "27".

Metering Rod Adjustment

Correct setting of metering rod is important and must be made after pump adjustment. Insert gauge (Tool No. T109-102) in place of metering rod, seating tapered end in metering rod jet. Hold gauge vertical to insure seating. With throttle valve seated there should be less than .005″ clearance between pin in pump arm and shoulder of notch in gauge. Gauge should not drag on pin. Adjustment should be made by bending metering rod pin portion of pump arm up or down.

Remove gauge, and install metering rod and disk. Connect metering rod spring.

Anti-Percolator Adjustment

Crack throttle valve .020″ by placing gauge T109-29 between valve and bore of carburetor (side opposite port). Bend rocker arm (Use tool T109-105) until there is a clearance of .005″ to .015″ between rocker arm and pump arm.

Fast Idle Adjustment

With fast idle cam held in normal idle position, tighten throttle lever adjusting screw until it just seats against cam. Hold throttle lever closed and pull cam back until first (or lower) step on cam is against (not on) set screw.

There should now be 5/8″ clearance between inside wall of air horn and lower edge of choke valve. (Use tool T109-85.) Adjustment can be made by bending at offset portion of fast idle link. (Use tool T109-41.)

Unloader Adjustment

With throttle valve wide open there should be 31/64″ clearance between lower edge of choke valve and inner wall of air horn. (Use tool T109-82.) Adjustment should be made by bending cam on throttle lever. (Use tool T109-41.)

Lock-Out Adjustment

With throttle and choke valves wide open, choke should lock in wide open position. Adjustment should be made by bending lip at lower end of fast idle link to give 1/32″ clearance between lip and throttle lever lock, with throttle and choke valves held wide open. (Use tool T109-105.)

CARBURETOR SPECIFICATIONS

Series	Car Serial Number	Engine Serial Number
4180	B-110001 and Higher	B-110001 and Higher

Dual Down-Draft Climatic Control Carburetor Model 511S

8 Cylinder Engine: 3⅛" Bore, 4¼" Stroke

Dimensions: Flange size, 1 inch dual, 3 bolt type.
Primary venturi, 11/32 inch I.D.
Secondary venturi, 19/32 inch I.D.
Main venturi, 1⅛ inch I.D.

Float Level: Distance from float to bowl cover, when needle is seated, to be 3/16 inch. (Fig. 1-C.)

Vents: Outside, No. 10 drill—four holes. Inside, none.

Gasoline Intake: Square vertical needle. Size No. 38 drill hole in needle seat.

Gas Line Connection: 5/16 inch fitting.

Low Speed Jet Tube: Jet size, No. 68 drill.
By-pass (plug), size No. 44 drill.
Economizer in body, size No. 50 drill.
Idle bleed, size No. 54 drill.

Idle Ports: Upper port, slot type, length, .200 inch; width .030".

Idle Port Opening: .140 to .146 inch above upper edge of valve with valve closed tight.

Lower Port (for Idle Adjustment Screw): Size .0615 to .0655 inch dia.

Set Idle Adjustment Screw: ½ to 1½ turns open. For richer mixture turn screw out. Do not attempt to idle engine below 7 m.p.h. on level road.

Main Nozzle: In primary venturi, angle 45°. Closed tip. Inside diameter No. 30 drill.
Upper hole: No. 70 drill on 45° angle.
Lower hole: No. 52 drill on 60° angle.

Metering Rod: Economy step .074 inch diameter; Middle step tapers to .069 inch diameter; Power step, .061 inch diameter. Length 2.922 inches.

Metering Rod Jet: .09055 inch diameter.

Metering Rod Setting: Use gauge, No. T109-113 (2.280 inches).

Accelerating Pump: High pressure type (spring operated lever) with adjustable pump stroke.
Discharge jet, size No. 72 drill.
Intake ball check, size No. 40 drill.
Discharge ball check, size No. 40 drill.
Relief passage to outside, No. 42 drill.

Pump Adjustment: 32/64 inch plunger travel (full throttle position) long stroke. Use gauge T109-117S.

Choke: Carter Climatic Control — set at index. Butterfly type, offset valve. Choke heat suction hole, in body, size No. 45 (.082 inch) drill.

Vacuum Spark Port: None.

CARBURETOR ADJUSTMENTS

Pump Adjustments

With pump connector link in upper hole in pump arm, and throttle adjustment screw backed out, pump plunger should travel 32/64" from closed to wide open position. Adjustment can be made by bending throttle connector rod at lower angle. (Use tool T-109-75.) Pump travel can be measured by using gauge T109-117S. Difference between reading at wide open and seated throttle should be 32. Projecting portion of indicator should be placed on top surface of connector link at pump shaft.

Metering Rod Adjustment

(a) Insert two metering rod gauges, T-109-113, in place of metering rods. Be sure gauges seat in metering rod jets, after backing out throttle lever adjusting so that throttle valves seat.

(b) Install metering rod pin and pin spring in metering rod arm.

(c) Rest screwdriver lightly on metering rod arm until metering rod pin rests on shoulders of

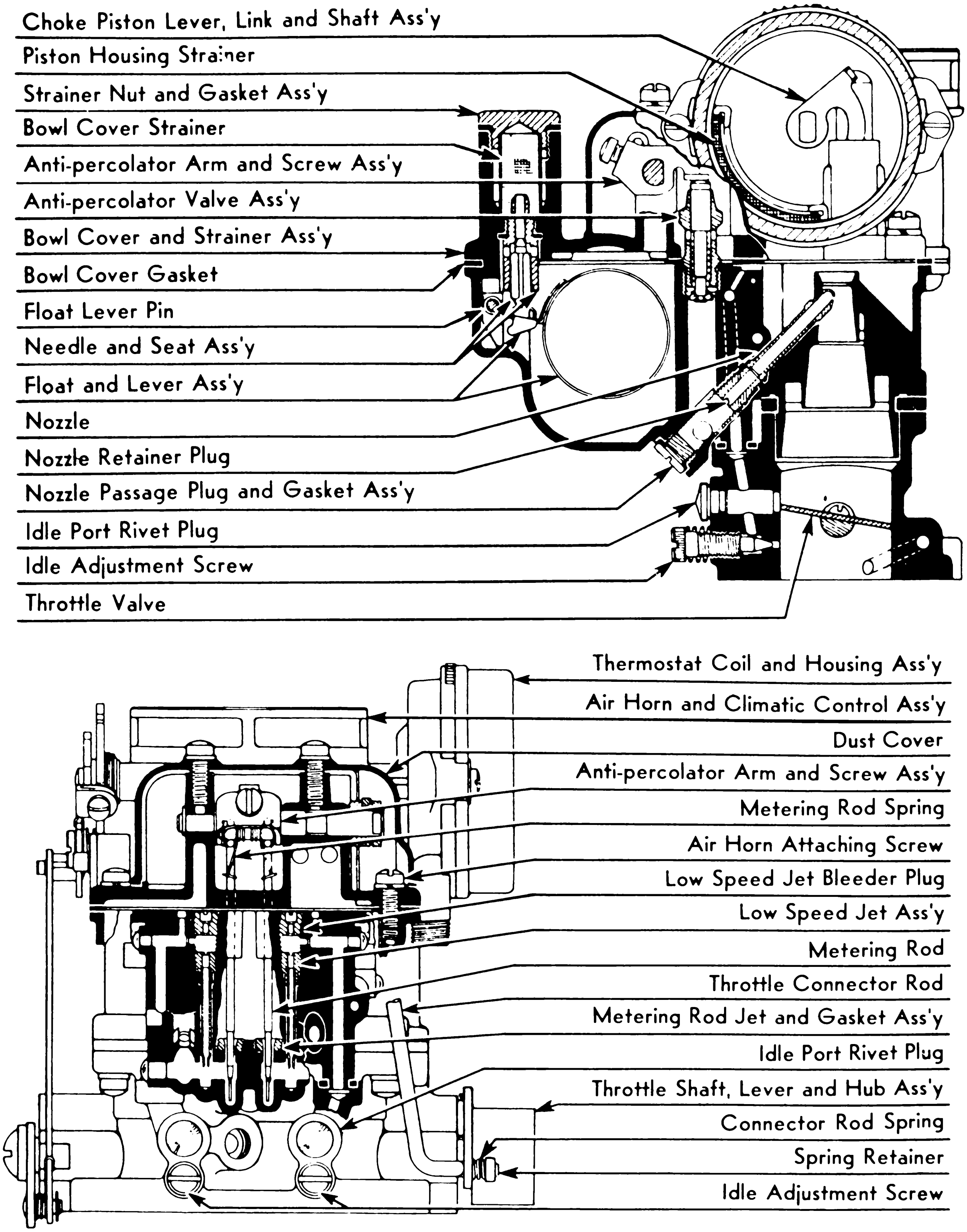

Choke Piston Lever, Link and Shaft Ass'y
Piston Housing Strainer
Strainer Nut and Gasket Ass'y
Bowl Cover Strainer
Anti-percolator Arm and Screw Ass'y
Anti-percolator Valve Ass'y
Bowl Cover and Strainer Ass'y
Bowl Cover Gasket
Float Lever Pin
Needle and Seat Ass'y
Float and Lever Ass'y
Nozzle
Nozzle Retainer Plug
Nozzle Passage Plug and Gasket Ass'y
Idle Port Rivet Plug
Idle Adjustment Screw
Throttle Valve
Thermostat Coil and Housing Ass'y
Air Horn and Climatic Control Ass'y
Dust Cover
Anti-percolator Arm and Screw Ass'y
Metering Rod Spring
Air Horn Attaching Screw
Low Speed Jet Bleeder Plug
Low Speed Jet Ass'y
Metering Rod
Throttle Connector Rod
Metering Rod Jet and Gasket Ass'y
Idle Port Rivet Plug
Throttle Shaft, Lever and Hub Ass'y
Connector Rod Spring
Spring Retainer
Idle Adjustment Screw

Figure 8—41-4280 Series Carburetor with Climatic Control.

notches in both gauges. A slight bend in metering arm may be necessary to equalize. There may be less than .005″ clearance between metering rod pin and gauges.

(d) With throttle valves seated and metering rod pin resting lightly on notches in gauges, tighten anti-percolator arm screw.

(e) Remove gauges and metering rod pin and install metering rods, disks, entering rod spring, pin and pin spring, and hook metering spring on metering rods.

Anti-Percolator Adjustment

This adjustment must be made after pump and metering rod adjustments have been made. Do not disturb these adjustments. Back out throttle lever adjusting screw so that throttle valves seat in bores of carburetor. With throttle valves seated, bend lips on anti-percolator arm so that center of indicator line is just flush with top of anti-percolator plugs. Since there are two anti-percolators on this carburetor, care must be taken so that there is an even adjustment on both anti-percolator arm lips.

Unloader Adjustment

With throttle wide open distance between upper edge of choke valve and inner wall of air horn should be 9/64″. (Use tool T109-34.) Adjustment can be made by bending lip on fast idle connector link. If unloader is adjusted properly, with throttle wide open move choker valve wide open and choker valve will be locked in wide open position. Closing the throttle will release choker valve. Choker trip lever is notched out for this setting.

Fast Idle Adjustment

Hold choker valve tightly closed and adjust fast idle arm screw to give .015″ opening between edge of throttle valve and bore of carburetor side opposite port. (Use gauge No. T109-44.)

CARBURETOR SPECIFICATIONS

Series	Car Serial Number	Engine Serial Number
4280	B-114001 and Higher	B-114001 and Higher

Dual Down-Draft Climatic Control Carburetor, Model 538S

8 Cylinder Engine: 3⅛″ Bore, 3¾″ Stroke

Dimensions: Flange size, 1 inch dual, 3 bolt type.
Primary venturi, 11/32 inch I.D.
Second venturi, 19/32 inch I.D.
Main venturi, 1⅛ inch I.D.

Float Level: Distance from float to bowl cover, when needle is seated, to be 3/16 inch. (Fig. 1-C.)

Vents: Outside, No. 10 drill—four holes. Inside, none.

Gasoline Intake: Square vertical push-pull needle. Size, No. 38 drill hole in needle seat.

Gas Line Connection: 5/16 inch fitting.

Low Speed Jet Tube: Jet size, No. 68 drill.
By-pass (plug), size No. 44 drill.
Economizer in body, size No. 50 drill.
Idle bleed, size No. 54 drill.

Idle Ports: Upper port, slot type, length .200 inch; width .030 inch.

Idle Port Opening: .140 to .146 inch above upper edge of valve with valve closed tight.

Lower Port: (For idle adjustment screw) Size .0615 to .0655 inch diameter.

Vacuum Spark Port: .039 to .041 inch diameter. Top of port .029 to .033 inch above valve.

Set Idle Adjustment Screw: ¼ to 1¼ turns open. For richer mixture turn screw out. Do not attempt to idle engine below 7 m.p.h. on level road.

Main Nozzle: In primary venturi, angle 45°.
Closed tip: Inside diameter No. 30 drill.
Upper hole: No. 70 drill on 45° angle.
Lower hole: No. 52 drill on 60° angle.

Metering Rod: Economy step .074 inch diameter; middle step tapers to .069 inch diameter; power step, .061 inch diameter. Length, 2.922 inches.

Metering Rod Jet: .09055 inch diameter.

Metering Rod Setting: Use gauge, No. T-109-113 (2.280 inches).

Accelerating Pump: High pressure type (spring operated level) with adjustable pump stroke. Discharge jet, size No. 72 drill. Intake ball check, size No. 40 drill.
Discharge ball check, size No. 40 drill.
Relief passage to outside, No. 42 drill.

Pump Adjustment: 32/64 inch plunger travel (full throttle position) long stroke. Use gauge T109-117S.

Choke: Climatic Control, set at index. Butterfly type, offset valve. Choke heat suction hole (in body), size No. 45 (.082") drill.

CARBURETOR ADJUSTMENTS

Pump Adjustments

With pump connector link in upper hole in pump arm, and throttle adjustment screw backed out pump plunger should travel 32/64" from closed to wide open position. Adjustment can be made by bending throttle connector rod at lower angle. (Use tool T109-75.) Pump travel can be measured by using gauge T109-117S. Difference between reading at wide open and seated throttle should be "32". Projecting portion of indicator should be placed on top surface of connector link at pump shaft.

Metering Rod Adjustment

(a) Insert two metering rod gauges, T-109-113, in place of metering rods. Be sure gauges seat in metering rod jets, after backing out throttle lever adjusting screw so that throttle valves seat.

(b) Install metering rod pin and pin spring in metering rod arm.

(c) Rest screwdriver lightly on metering rod arm until metering rod pin rests on shoulders of notches in both gauges. A slight bend in metering arm may be necessary to equalize. There may be less than .005" clearance between metering rod pin and gauges.

(d) With throttle valves seated and metering rod pin resting lightly on notches in gauges, tighten anti-percolator arm screw.

(e) Remove gauges and metering rod pin and install metering rods, disks, metering rod spring, pin and pin spring, and hook metering spring on metering rods.

Anti-Percolator Adjustment

This adjustment must be made after pump and metering rod adjustments have been made. Do not disturb these adjustments. Back out throttle lever adjusting screw so that throttle valves seat in bores of carburetor. With throttle valves seated, bend lips on anti-percolator arm so that center of indicator line is just flush with top of anti-percolator plugs. Since there are two anti-percolators on this carburetor, care must be taken so that there is an even adjustment on both anti-percolator arm lips.

Unloader Adjustment

With throttle wide open distance between upper edge of choke valve and inner wall of air horn should be 9/64". (Use tool T-109-34.) Adjustment can be made by bending lip on fast idle connector link. If unloader is adjusted properly, with throttle wide open move choker valve wide open and choker valve will be locked in wide open position. Closing the throttle will release choker valve. Choker trip lever is notched out for this setting.

Fast Idle Adjustment

Hold choker valve tightly closed and adjust fast idle arm screw to give .015" opening between edge of throttle valve and bore of carburetor side opposite port. (Use gauge No. T109-44.)

CLUTCH SECTION

Nash

TECHNICAL MANUAL

DESCRIPTION 2

SERVICING THE CLUTCH 2

CLUTCH DISASSEMBLY 2

CLUTCH ASSEMBLY 3

CLUTCH LEVER ADJUSTMENT 3

CLUTCH DRIVE PLATE 4

CLUTCH INSTALLATION 4

CLUTCH THROW-OUT RELEASE RETAINER 5

CLUTCH PEDAL LINKAGE 5

CLUTCH DIAGNOSIS 7

SPECIFICATIONS 8-9

CLUTCH SECTION
NASH TECHNICAL MANUAL

DESCRIPTION

The clutch is a single plate, dry disc type. (Borg and Beck) A steel cover bolted to the flywheel contains the clutch drive plate, the pressure plate, clutch levers and springs. (Fig. 1.)

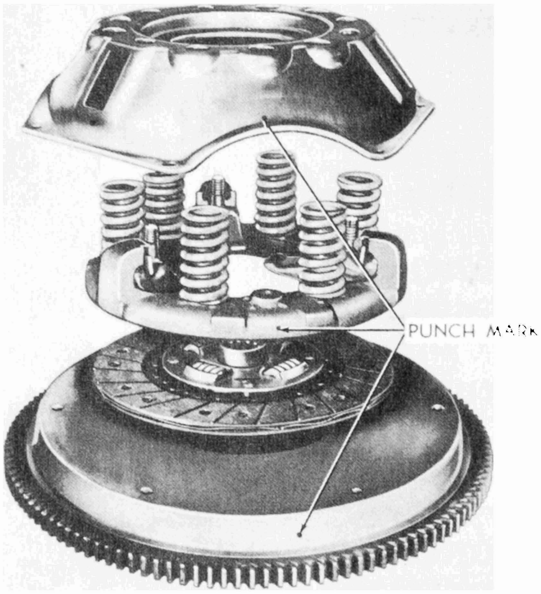


Figure 1—41-42-46-47-4840 Clutch.

The clutch drive plate is spring-cushioned with a facing riveted to both sides. The coil springs around the hub absorb the power shocks and cushion the driving mechanism.

The clutch throw-out bearing is of the ball bearing type, packed at the factory, and requires no further lubrication.

> CAUTION: *Never wash the clutch throw-out bearing in kerosene, gasoline, or any other similar solvent which might cause the lubricant packed in the bearing to be washed away.*

No adjustment for wear is provided in the clutch itself. An individual adjustment is built into the clutch cover to adjust the height of the release levers in manufacture, but this adjusting nut is locked in position and should never be disturbed unless the clutch assembly has been disassembled for the replacement of worn parts.

SERVICING THE CLUTCH

Removing the Clutch

Always mark the clutch cover, pressure plate, and flywheel before removing so that when they are reassembled they will be in their same relative positions to maintain balance. If new parts are installed they are held within good balance limits in manufacture.

> CAUTION: *When removing clutch cover from the flywheel loosen each cap screw a few turns, until the spring tension on the cover has been released. The clutch cover is a steel stamping which could be sprung by incorrect removal; resulting in clutch chatter when reused.*

Crankshaft Pilot Bearing

When a clutch assembly is removed from the flywheel always remove the crankshaft pilot bushing using clutch pilot bushing-removing tool No. J-1418-A. The installation of a new bushing is insurance against clutch chatter after reassembly. Always pack this bushing with a short-fiber, medium wheel-bearing grease. To maintain lubrication for this bushing, pack about 1 oz. in the recess behind the bushing.

CLUTCH DISASSEMBLY

The clutch cover and pressure plate are under spring tension at all times so that care should be taken when a clutch cover assembly is disassembled. Place the clutch cover assembly in an arbor press with a hard wood block under the pressure plate. Have the block of such a length that the cover can move down and not interfere with the block. Place a wood block across the top of the cover so that it rests on the spring bosses and does not interfere with the eye-bolt adjusting nuts.

Compress the clutch cover in the press until the clutch release levers are free. Remove the adjusting nuts.

> CAUTION: *When relieving the spring pressure notice that the cover does not stick on the pressure plate bosses. Remove the cover for inspection of parts.*

Clutch Pressure Springs

A thorough inspection of the clutch assembly springs should always be made. They should be tested for spring height and tension when the spring is compressed at a given length. (See Clutch Specifications, Pages 8, 9.)

Clutch Adjusting Levers

A thorough inspection should be given the levers, the eye-bolt pin and the fulcrum. If they show any wear replace them.

Clutch Pressure Plate

Inspect the pressure plate to make sure that it is not warped, or cracked. Check on a surface plate for flatness as a pressure plate out of alignment will result in clutch chatter.

Flywheel Face

Inspect the condition of the flywheel as well as the pressure plate for any roughness; a condition found when a clutch has been over-heated. Put a torque wrench on the flywheel bolts to make sure they are tight. The torque should be from 55 to 60 ft. lbs.

Transmission Clutch Shaft

Slide the clutch drive disc onto the transmission clutch shaft to make sure that its movement is free on the splines. Also check for spline wear. *Use a new clutch drive disc and hub* for this check. If excessive play is found replace the transmission clutch shaft.

If the splines on the transmission clutch shaft are burred remove with a fine file or stone. If the movement of the clutch drive plate is not free on the splines the result will be clutch drag and hard shifting of transmission gears.

A loose or worn front transmission bearing will cause clutch chatter. Check this bearing for excessive play before the transmission is installed.

Clutch Cover Oil Baffle

This is a steel stamping placed in the pressure plate to deflect oil vapor from the clutch driving plate and clutch surfaces. Check to see that this baffle fits tight in the pressure plate, but does not buckle or have a tin-canning effect. A good many rod bearings have been replaced because of noise caused by this baffle being dished or bent in a clutch overhaul.

ASSEMBLY OF CLUTCH

Be sure to keep all parts clean, and work on clean surfaces, so that clutch surfaces are not scratched or damaged.

After all levers are installed, place the clutch pressure springs in a vertical position on each spring boss. (See that each spring is making a flat contact with the spring boss, so that the spring will not be distorted under pressure.)

Check the anti-rattle springs in the clutch cover and place the cover on top of the pressure plate assembly. See that the top of each pressure spring enters its spring seat in the cover. (Line up punch marks on cover and pressure plate for balance.)

Slowly compress the cover making sure that the eye-bolts and pressure plate lugs are guided through the proper holes in the cover.

Tighten the adjusting nuts until they are flush with the tops of the eye-bolts.

Remember that the lugs of the pressure plate work up and down in the cover, so if the lugs contact the cover, a squeak will develop in the clutch as the clutch lever is operated. Use a little Lubriplate No. 110 on each side of the lug and check to see that it has a little clearance.

CLUTCH LEVER ADJUSTMENT

Place clutch gauge plate J-1507 or J-2584 on the flywheel in the same position as the clutch drive plate. (See Fig. 2.) Mount the cover assembly, center the plate and line up the three machine lands on the plate directly under the levers as shown.

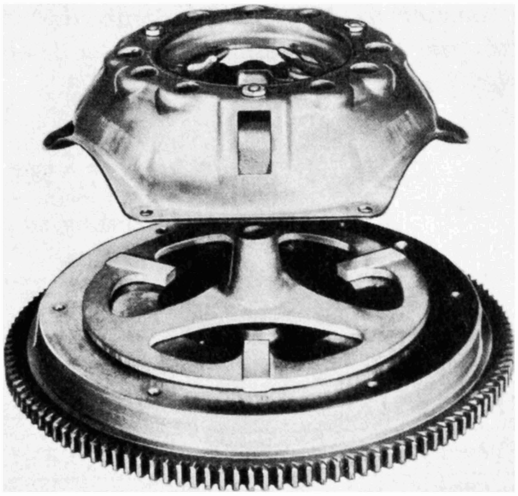


Figure 2—Clutch Gauge Plate (J-1507—J-2584) In Place.

Tighten the cover screws in rotation, one to two turns at a time, to avoid distortion of the cover.

Depress each lever several times with a wood block. This will seat the levers in their operating positions.

41-4240 Series

Lever adjustment for 41-4240, using original replacement parts. Place the gauge on the hub (see Fig. 3) so that offset of the gauge is down 3/16″ below the hub, as shown. Turn the adjusting nut for the lever, to be checked, until the lever is flush with the underside of the gauge. Adjust the other two levers in the same manner. However, in all cases adjust levers to specifications for the drive plate being installed, whenever substituted parts are used.

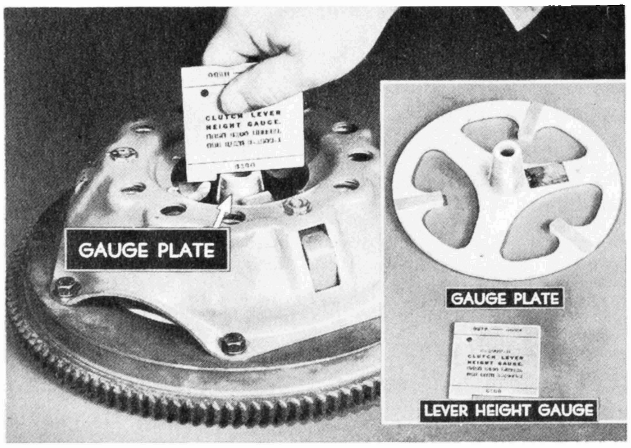


Figure 3—Method of Adjusting Clutch Levers.

41-4260-80, 46-47-4860 Series

Lever adjustment for these series is made in the same manner as 41-4240, but with the straight side of the gauge down so that the levers are adjusted flush with the hub. (See Fig. 3.)

Locking Adjusting Nuts

Before staking the adjusting nuts to lock them in place, work the lever up and down and recheck lever adjustment again. Stake the nut with a dull punch so that the nut metal is forced into a groove in the eye-bolt.

CLUTCH DRIVEN PLATE

No repairing of the clutch drive plate should be done other than the replacement of facings.

To replace facings requires extreme care and must not be attempted without the proper tools and riveting equipment.

Use Only Facings Supplied by Nash Parts Department.

CLUTCH INSTALLATION

In order to install the clutch drive plate and clutch cover assembly, use aligning tool J-1625. Align index marks.

CAUTION: *Be sure that the side of the drive plate marked "Flywheel side" is placed toward the flywheel.*

This tool aligns the clutch drive plate so that the transmission clutch shaft will enter easily. Make sure that the clutch pedal is not depressed until the transmission has been installed as the plate will drop out of alignment position.

46-47-4840 Series

Due to a change made in the thickness of the clutch driven plate of the 4640-4740 and 4840 clutch, a new gauge plate and lever height setting is required.

It is very important that the correct lever height setting be maintained on all 40-series clutch cover assemblies, to obtain a clear clutch release.

CLUTCH DRIVE PLATE, SERIES, AND THE CORRECT LEVER SETTING

Use height setting as shown for driven plate being installed.

Clutch Drive Plate No.	Series	Lever Height Setting
No. 3110788	41-4240	3/16″ Below Gauge Plate Hub
No. 3121856-3123169	46-4740	1/16″ Below Gauge Plate Hub
No. 3124361—Beginning with Serial No. K-178382	4740	1/32″ Above Gauge Plate Hub
No. 3125006—Beginning with Serial No. K-196325	4740-4840	1/32″ Above Gauge Plate Hub
No. 3126326—For Service Only	41-42-46-47-4840	1/16″ Below Gauge Plate Hub

Clutch plate, Part No. 3126326, having AMCO facings on both sides is now available for service and can be identified with the part number stamped on the plate hub. It will also include a 1/16″ identifying mark for the correct lever height setting.

CLUTCH THROW-OUT RELEASE BEARING

41-42-46-47-4840 Series

The clutch throw-out, or release mechanism, on these Series consists of a forked lever which pivots on a ball stud threaded into the clutch housing. A retaining spring, as shown in Fig. 5, is anchored to a clip under the ball stud and holds the lever in contact with the ball stud. The clutch throw-out bearing, which is a pre-lubricated unit, is attached to the forked end of the throw-out lever by a spring clip on the bearing.

41-4260-80, 46-47-4860 Series

The clutch throw-out, or release mechanism, on these Series consists of a release shaft which operates a lever and bearing sleeve. The bearing is held onto the sleeve by a strut.

The clutch throw-out release bearings used in 4140-60-80 Series to the present, are pre-lubricated bearings. *Never wash them in gasoline or any solvent that will dissolve the lubricant.* It is neither necessary nor possible to lubricate these bearings at any time.

41-4260-80 Series

The clutch throw-out shaft used on these Series has needle bearings at each end of the shaft in the housing. These bearings were lubricated at time of assembly. No provision is made for lubrication unless they are removed for other work. There is a felt seal washer and retainer at the outer ends of the shaft. The 46-47-4860 Series up to R-480616 are provided with a lubrication fitting. After this number an oil cup is used. Lubricate at approximately 10,000-mile intervals. *Do not overlubricate.*

CLUTCH PEDAL LINKAGE

The easy free operation of a good working clutch is maintained through the correct adjustment of the clutch pedal linkage. Good adjustment means that the minimum amount of pedal pressure is required to operate the clutch.

41-42-4640 Series Up To Serial No. N4-125727

The following clutch pedal linkage adjustment is for 41-42-4640 Series up to service Serial number N4-125727. (Fig. 4.) Free pedal play should be 3/4″.

There should, however, be sufficient free movement to prevent the release bearing from coming in contact with the clutch operating levers when the clutch is engaged and the clutch pedal fully released. Varying the length of the adjustment link between the inner lever on the idler shaft and the throw-out lever varies the free play. Lengthening this link reduces the free pedal play. Shortening the length increases the pedal play.

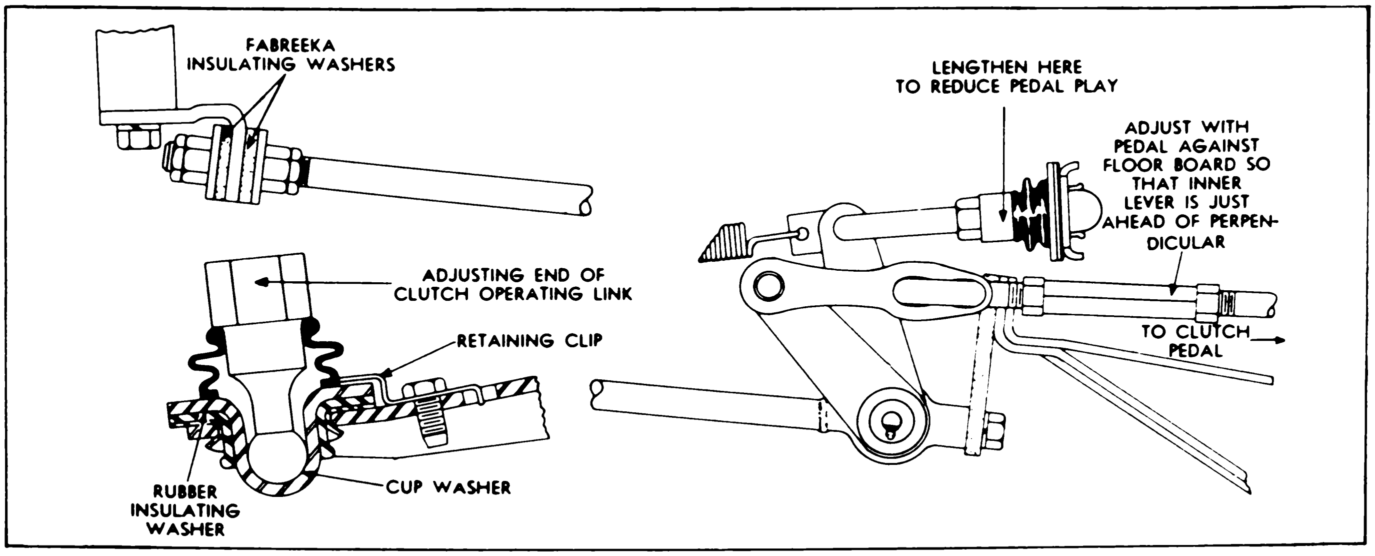

FABREEKA INSULATING WASHERS
LENGTHEN HERE TO REDUCE PEDAL PLAY
ADJUST WITH PEDAL AGAINST FLOOR BOARD SO THAT INNER LEVER IS JUST AHEAD OF PERPENDICULAR
ADJUSTING END OF CLUTCH OPERATING LINK
RETAINING CLIP
TO CLUTCH PEDAL
RUBBER INSULATING WASHER
CUP WASHER

Figure 4—41-42-4640 Series Up To Serial No. N4-125727 Clutch Release Linkage.

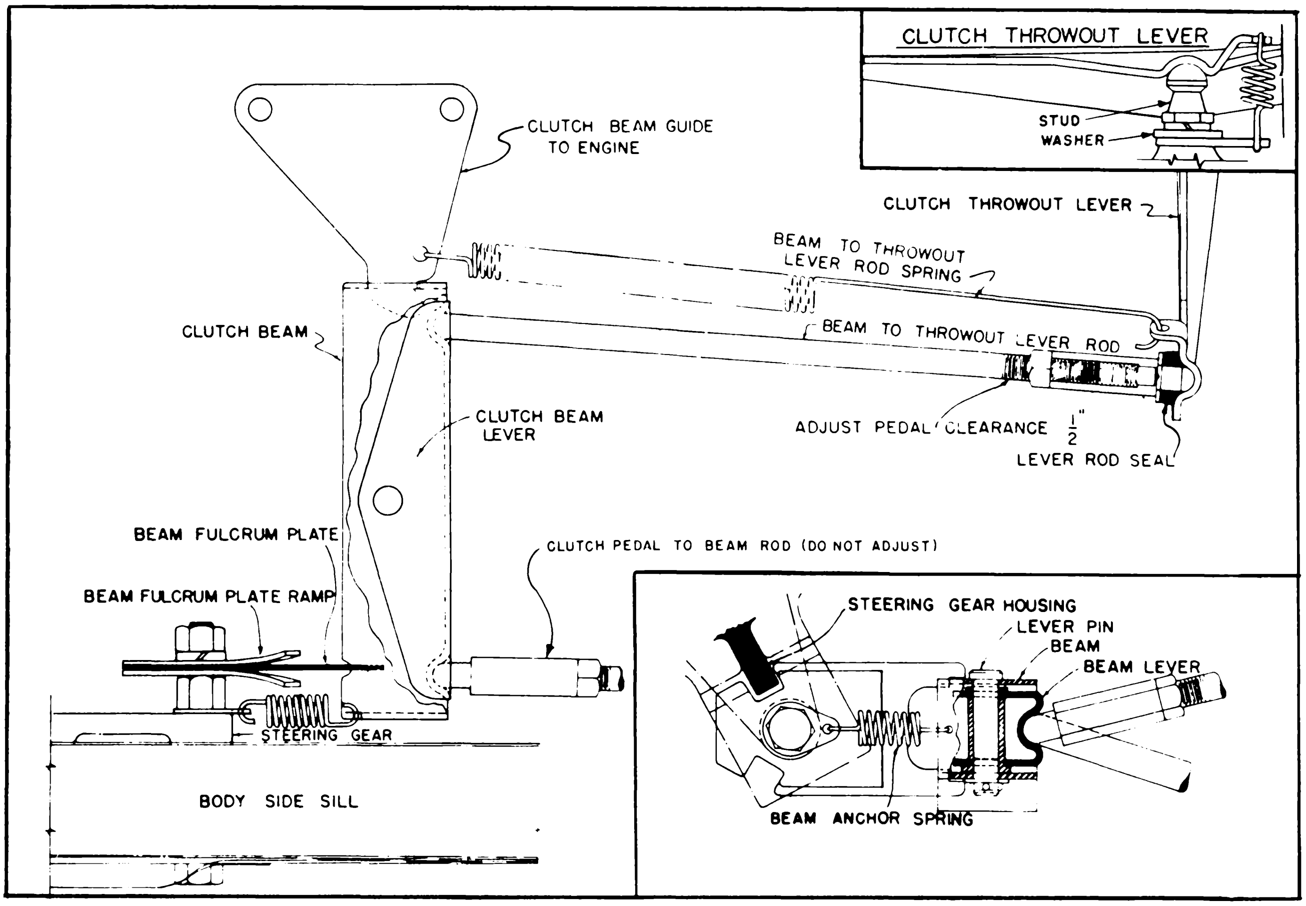

CLUTCH THROWOUT LEVER
STUD
WASHER
CLUTCH BEAM GUIDE TO ENGINE
CLUTCH THROWOUT LEVER
BEAM TO THROWOUT LEVER ROD SPRING
CLUTCH BEAM
BEAM TO THROWOUT LEVER ROD
CLUTCH BEAM LEVER
ADJUST PEDAL CLEARANCE 1/2"
LEVER ROD SEAL
BEAM FULCRUM PLATE
CLUTCH PEDAL TO BEAM ROD (DO NOT ADJUST)
BEAM FULCRUM PLATE RAMP
STEERING GEAR
BODY SIDE SILL
STEERING GEAR HOUSING
LEVER PIN
BEAM
BEAM LEVER
BEAM ANCHOR SPRING

Figure 5—46-47-4840 Series Beam Type Clutch Release and Clutch Throw-out Lever.

46-47-4840 Series Starting with Serial No. N4-125727

The beam type clutch release linkage (see Fig. 5) became effective with Service Serial number N4-125727. Adjustment for free pedal play is made by adjusting the beam to the throw-out lever rod. *Do not disturb the adjustment on the pedal to beam rod.*

To lubricate disconnect the throw-out lever spring and apply Lubriplate to the ends of the pedal rod and lever rod. Use light oil on the clutch beam lever pivot pin.

Centering Beam Support

The clutch beam support is hooked over a support plate mounted to the engine. (See Fig. 5.) The outer end of the clutch beam support rests on the beam fulcrum plate and is held on these supports by the beam anchor spring and the throw-out return spring. Any variation of the position of the beam fulcrum plate will cause the clutch beam support to climb out of the hook and result in chattering.

To correct, use spacing washers between the beam anchor spring plate and the steering gear mounting pad as shown in Fig. 5 so that the beam support will be centered on its two supports. Also see that the pull of the beam anchor spring is parallel to the beam fulcrum plate.

41-4260-80, 46-47-4860 Series Adjustments

The clutch free pedal play should be maintained at ½″ at all times, and is adjusted as shown. (Fig. 6.)

Install aligning pin J-1390 (see Fig. 6-B) and loosen spring lever screw on the end of clutch throw-out shaft.

To reduce pedal play, tighten adjusting nut (see Fig. 6-A) on pedal rod, which shortens pedal rod. To increase pedal play, turn the adjusting nut to lengthen the pedal rod. *Always tighten the jam nut when through.*

Remove all end play from the clutch throw-out shaft before tightening spring lever screw. (See Fig.

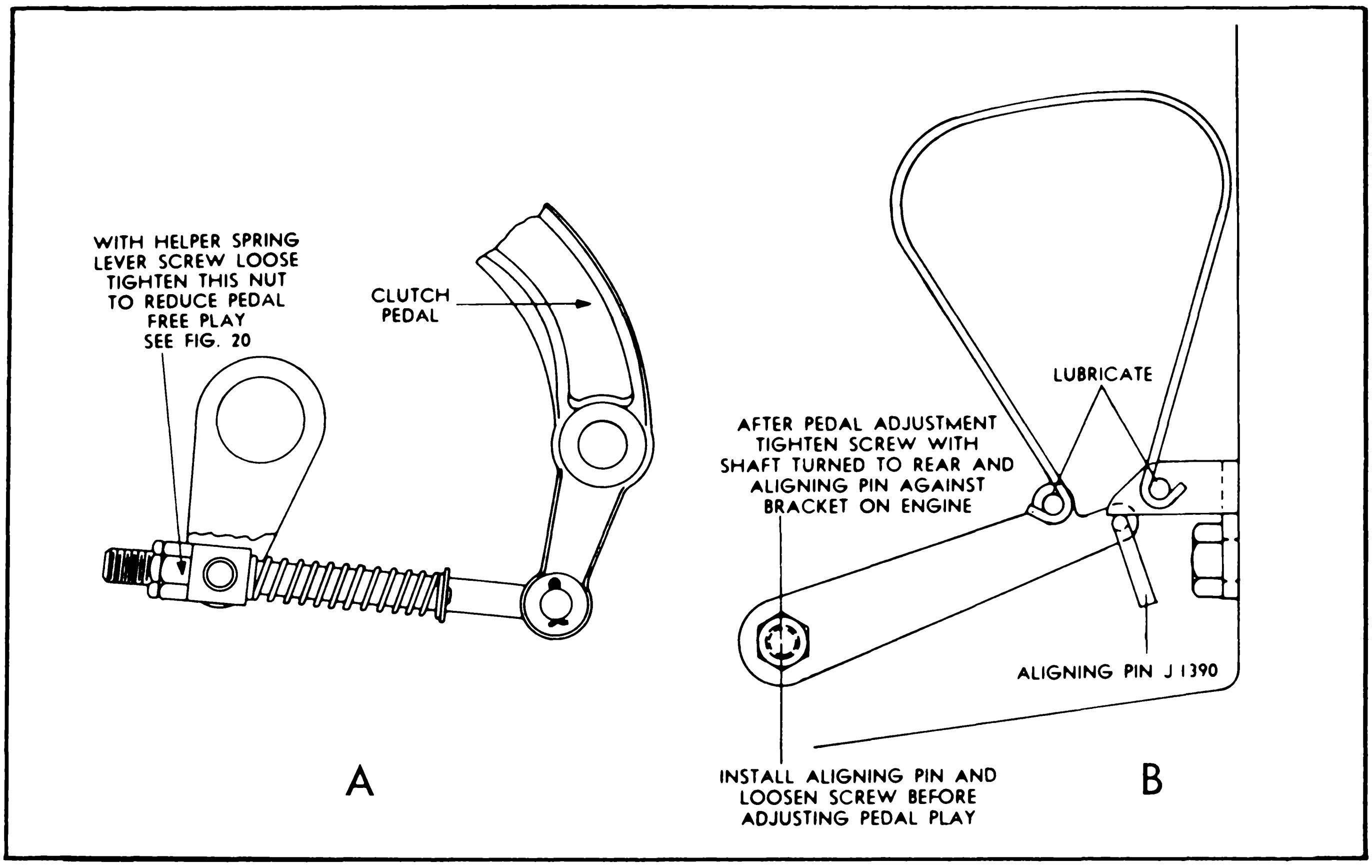

WITH HELPER SPRING LEVER SCREW LOOSE TIGHTEN THIS NUT TO REDUCE PEDAL FREE PLAY SEE FIG. 20
CLUTCH PEDAL
A
LUBRICATE
AFTER PEDAL ADJUSTMENT TIGHTEN SCREW WITH SHAFT TURNED TO REAR AND ALIGNING PIN AGAINST BRACKET ON ENGINE
ALIGNING PIN J 1390
INSTALL ALIGNING PIN AND LOOSEN SCREW BEFORE ADJUSTING PEDAL PLAY
B

Figure 6A—41-4260-80, 46-47-4860 Series Clutch Operating Linkage.
Figure 6B—41-4260-80, 46-47-4860 Series Clutch Helper Spring Adjustment.

6-A.) Make sure that the aligning pin is against the pivot bracket as shown.

If the helper spring is adjusted too low the clutch pedal will not return. The throw-out bearing will ride the levers, causing the clutch to slip.

If the helper spring lever is too high the clutch pedal pressure will be heavy and strike the side of the floor board on its return.

CAUTION: *Always use aligning pin when making a clutch pedal linkage adjustment.*

DIAGNOSIS OF THE CLUTCH

Clutch Chatter—Chatter may be caused by:

a. **Grease** on the clutch facings
b. **Binding** of the clutch linkage
c. **Loose** or damaged clutch facings
d. **Loose** engine mountings
e. **Incorrect** adjustment of clutch pressure levers

Clutch Grabbing—Clutch grabbing may be caused by:

a. **Oil or grease** on clutch drive plate facings
b. **Oil** on pressure plate
c. **Broken** facings
d. **Broken** pressure plate
e. **Clutch** plate binding on transmission clutch shaft

Clutch Slipping—A slipping clutch may be caused by:

a. **Incorrect** adjustment of clutch pedal
b. **Lack** of lubrication in clutch linkage binding
c. **Broken** clutch pressure springs
d. **Weak** pressure springs

Clutch Dragging—A dragging clutch may be caused by:

a. **Incorrect** adjustment of clutch pedal
b. **Incorrect** clutch lever adjustment
c. **Loose** or broken facings
d. **Bent** or dished clutch plate due to over-heating

CLUTCH SPECIFICATIONS

Year Series	**4140**	**4240**	**4640**	**4740**	**4840**
Make	Borg & Beck	Borg & Beck	Borg & Beck	Borg & Beck	Borg & Beck
Type	Single Plt. 2 Dry Disc	Single Plt. 2 Dry Disc	Single Plt. 2 Dry Disc	Single Plt. 2 Dry Disc	Single Plt. 2 Dry Disc
Throw-out Bearing Type	Sealed No Lub.	Sealed No Lub.	Sealed No Lub.	Sealed No Lub.	Sealed No Lub.
Pedal Adjustment	½″ to ¾″ Free Play	½″ to ¾″ Free Play	½″ to ¾″ Free Play	½″ to ¾″ Free Play	½″ to ¾″ Free Play
Clutch Lever Height	See Page 4	See Page 4	See Page 4	See Page 4	See Page 4
Cover Screws, Torque Tightening	15 to 20 Ft. Lbs.	15 to 20 Ft. Lbs.	15 to 20 Ft. Lbs.	15 to 20 Ft. Lbs.	15 to 20 Ft. Lbs.
Clutch Facing Outside Dia.	8″	8″	8″	8″	8″
Clutch Facing Thickness	.125″	.125″	.125″	.125″	.125″
No. of Springs	6	6	6	6	6
Compressed Length	195 Lbs. ± 5 at 1½″	195 Lbs. ± 5 at 1½″	195 Lbs. ± 5 at 1½″	195 Lbs. ± 5 at 1½″	195 Lbs. ± 5 at 1½″
Color of Spring	Red	Red	Red	Red	Red
Flywheel Stud Nuts Torque Tightening	55 to 60 Ft. Lbs.	55 to 60 Ft. Lbs.	55 to 60 Ft. Lbs.	55 to 60 Ft. Lbs.	55 to 60 Ft. Lbs.

Year Series	**4160**	**4260**	**4660**	**4760**	**4860**
Make	Borg & Beck	Borg & Beck	Borg & Beck	Borg & Beck	Borg & Beck
Type	Single Plt. 2 Dry Disc	Single Plt. 2 Dry Disc	Single Plt. 2 Dry Disc	Single Plt. 2 Dry Disc	Single Plt. 2 Dry Disc
Throw-out Bearing Type	Sealed No Lub.	Sealed No Lub.	Sealed No Lub.	Sealed No Lub.	Sealed No Lub.
Pedal Adjustment	½″ to ¾″ Free Play	½″ to ¾″ Free Play	½″ to ¾″ Free Play	½″ to ¾″ Free Play	½″ to ¾″ Free Play
Clutch Lever Height	See Page 4	See Page 4	See Page 4	See Page 4	See Page 4
Cover Screws, Torque Tightening	35 to 40 Ft. Lbs.	35 to 40 Ft. Lbs.	35 to 40 Ft. Lbs.	35 to 40 Ft. Lbs.	35 to 40 Ft. Lbs.
Clutch Facing Outside Dia.	10″	10″	10″	10″	10″
Clutch Facing Thickness	.125″	.125″	.125″	.125″	.125″
No. of Springs	9	9	9	9	9
Compressed Length	165 Lbs. ± 5 at $1\frac{11}{16}''$	165 Lbs. ± 5 at $1\frac{11}{16}''$	165 Lbs. ± 5 at $1\frac{11}{16}''$	165 Lbs. ± 5 at $1\frac{11}{16}''$	165 Lbs. ± 5 at $1\frac{11}{16}''$
Color of Spring	Light Blue	Light Blue	Light Blue	Light Blue	Light Blue
Flywheel Stud Nuts Torque Tightening	55 to 60 Ft. Lbs.	55 to 60 Ft. Lbs.	55 to 60 Ft. Lbs.	55 to 60 Ft. Lbs.	55 to 60 Ft. Lbs.

CLUTCH SPECIFICATIONS

Year Series	**4180**	**4280**
Make	Borg & Beck	Borg & Beck
Type	Single Plt. 2 Dry Disc	Single Plt. 2 Dry Disc
Throw-out Bearing Type	Sealed No Lub.	Sealed No Lub.
Pedal Adjustment	½″ to ¾″ Free Play	½″ to ¾″ Free Play
Clutch Lever Height	See Page 4	See Page 4
Cover Screws, Torque Tightening	35 to 40 Ft. Lbs.	35 to 40 Ft. Lbs.
Clutch Facing Outside Dia.	10″	10″
Clutch Facing Thickness	.125″	.125″
No. of Springs	9	9
Compressed Length	165 Lbs. ± 5 at 1$^{11}/_{16}$″	165 Lbs. ± 5 at 1$^{11}/_{16}$″
Color of Spring	Light Blue	Light Blue
Flywheel Stud Nuts, Torque Tightening	55 to 60 Ft. Lbs.	55 to 60 Ft. Lbs.

BRAKES AND WHEELS HUBS AND DRUMS SECTION

Nash

TECHNICAL MANUAL

THE HYDRAULIC SYSTEM 2
OPERATION OF THE SYSTEM 4
PEDAL ADJUSTMENT 4
BLEEDING HYDRAULIC LINES 5
MINOR BRAKE ADJUSTMENT 6
MAJOR BRAKE ADJUSTMENT 6
NASH HYDRAULIC FLOATING SHOE BRAKE 8
HAND BRAKE ADJUSTMENT 12
BRAKE DIAGNOSIS 13
WHEEL AND TIRE SECTION 14
TIRE PRESSURE 14
WHEEL BALANCE 15
FRONT WHEEL BEARING ADJUSTMENT 15
REAR WHEEL AND BEARING INSPECTION 15
BRAKE SPECIFICATIONS 16
WHEEL AND TIRE SPECIFICATIONS 17

BRAKES AND WHEELS— HUBS AND DRUMS SECTION

NASH TECHNICAL MANUAL

41-4260-80, 46-47-4860 Series

In these series Nash-Lockheed Hydraulic brakes are used in conjunction with Bendix Servo type brake operating mechanisms.

41-42-46-47-4840 Series

In these series Nash-Lockheed Hydraulic brakes are used in conjunction with Bendix Non-Servo type brake operating mechanisms.

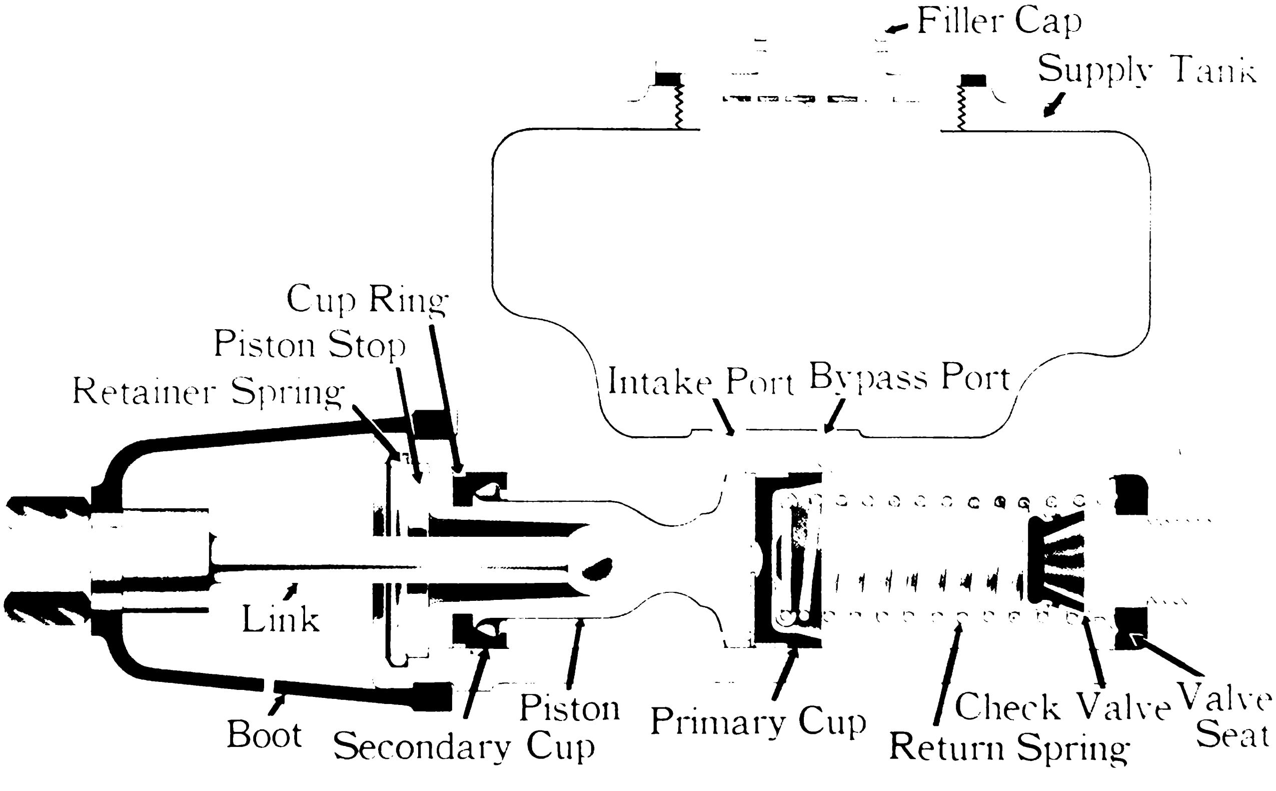
THE HYDRAULIC SYSTEM

Description

The hydraulic brake system consists of a combination type reservoir tank and master cylinder equipped with piston, push rod, return spring, and check valve; wheel cylinders; and flexible hose and tubing which connect the master cylinder to the wheel cylinders.

Master Cylinder

The compensating-type master cylinder contains the fluid-actuating piston, return spring, check valve, and the piston push rod which makes contact between the piston and the brake pedal operating lever. The piston is equipped with a primary cup of synthetic rubber and a secondary cup of the same material. When extended, the piston push rod is housed in a flexible synthetic rubber boot which serves to keep foreign matter out of the system. The



Filler Cap
Supply Tank
Cup Ring
Piston Stop
Retainer Spring
Intake Port
Bypass Port
Link
Boot
Secondary Cup
Piston
Primary Cup
Check Valve
Return Spring
Valve Seat

Figure 1—Master Brake Cylinder

cylinder is equipped with an intake port and a bypass port opening into the reservoir.

The master cylinder performs two functions:

1. With the reservoir in the master cylinder full of fluid, a constant volume of fluid is maintained in the system at all times regardless of expansion or contracting of the fluid and acts as a pump during the "bleeding" operation.

2. It permits additional fluid to enter the system to counterbalance any loss due to gravity seepage.

Piston

The fluid actuating piston is machined with a deep concave depression in its dry end to receive the piston push rod. The body of the piston is roughly spool-shaped and its pressure end is drilled with several holes around its flange to permit the fluid to flow from the reservoir into the pressure end of the cylinder when the lip of the primary cup is relaxed during the return stroke of the piston.

Primary Cup

The primary cup is attached to the pressure end of the piston and serves to seal the pressure area of the cylinder during the braking stroke by the action of the return spring and the pressure on the fluid. On the return stroke of the piston the lip of the primary cup falls away from the cylinder walls to permit fluid flowing from the reservoir to enter the pressure end of the cylinder. Note that in the return position the lip of the primary cup is *clear of the by-pass port.*

Secondary Cup

The piston is equipped with a secondary cup, at the compression rod end, to prevent the fluid from leaking into the boot.

Piston Push Rod

The piston push rod transfers to the piston the force exerted on the brake pedal. Note that the pedal adjustment setting is incorporated in the push rod construction. This setting is critical and assures the clearance of the by-pass port with reference to the lip of the primary cup.

Return Spring

The return spring works under compression and serves to return the piston to the released position. It also keeps the lip of the primary cup tight against the master cylinder walls and over the holes in the pressure end of the piston to seal the cylinder during the pressure stroke. Finally, it serves to keep the check valve seated.

Check Valve

At the outlet end of the master cylinder there is a check valve that allows the fluid to pass into the brake lines when the brake foot pedal is depressed, but on the return of the fluid this check valve closes with the pressure of the fluid exerted by the brake shoe return spring. This return pressure now opens the return valve that seats in the end of the master cylinder. This valve opens against the pressure of the master cylinder return spring which in turn will close this valve just before all of the pressure of the returning fluid is spent, retaining a slight pressure in the brake line. The purpose of this pressure is to hold the lips of the wheel cylinder cups against the wheel cylinder, ready for action.

Tubing and Flexible Hose

The tubing and flexible hose serve to connect the master cylinder with the four wheel cylinders. Since a hydraulic system must be a closed system this equipment must be free of leaks to prevent the escape of the fluid and the entrance of foreign matter, including air, to the system.

Wheel Cylinders

Each wheel cylinder contains a pair of opposed pistons fitted with rubber cups and a small compression spring to keep the cups tight against the cylinder walls. The outer ends of the pistons make contact with the brake shoes to impart the outward braking thrust against the brake drums.

Hydraulic Fluid

Nash-Lockheed Hydraulic Brake Fluid is chemically designed to provide free flow during cold weather, the avoidance of vapor under high temperatures, the protection of both rubber and metal parts of the system, and the necessary stability with reference to hydraulic characteristics. The mechanic will avoid difficulty in meeting any of the above mentioned requirements for fluid by using only Nash-Lockheed Hydraulic Brake fluid in the system.

OPERATION OF THE SYSTEM

The Braking Stroke

When you push down on the brake pedal the piston push rod moves forward. There is 1/4" to 1/2" of free travel of the brake pedal before the push rod *seats against the piston.* This travel is called, "free pedal movement" and is necessary to insure clearance of the by-pass port when the brake pedal is in the released position. As the piston moves forward in the cylinder the lip of the primary cup covers the by-pass port and pressure is put onto the column of fluid in the system. The pistons in each wheel cylinder are forced apart and bring the brake shoes, to which they are connected, against the rotating brake drum, thus arresting the forward motion of the car.

It should be understood that *equal fluid pressure* is applied against each brake drum regardless of wear in either the drum or brake shoe, or the distance each shoe travels before coming in contact with the drum. The mechanic should not assume, however, that equal brake pressure on all wheel drums is the only factor involved in arresting the motion of an automobile. While the great advantage of having equal pressure on all brake drums is present in a hydraulic brake system, it must be remembered that it does not counteract the effects of differences in braking area on the shoe or drum, the amount and condition of rubber in contact with the highway, or the condition of the highway surface with reference to each wheel.

Return Stroke

When you release the brake pedal the master cylinder piston is immediately returned to the released position by the action of the return spring. A partial vacuum in the master cylinder draws additional fluid from the reservoir through the intake port. At the same time the primary cup is relaxed and the additional fluid flows through the holes in the pressure end of the piston and past the lip of the primary cup into the pressure side of the cylinder. Thus the cylinder is prepared for the next time you push down on the brake pedal. This operation is necessary because the fluid forced forward in the lines on the braking stroke does not return to the cylinder fast enough for repeated braking. However, this fluid does return to the cylinder after the piston has returned to the released position, through the action of the brake shoe return springs, which forces the wheel pistons together. The master cylinder check valve maintains a slight pressure on the fluid, when the brake is released. This pressure is maintained to keep the synthetic rubber cups in the wheel cylinders always tight against the cylinder walls for quick action. Since the return stroke of the piston has drawn additional fluid into the master cylinder from the reservoir, the return fluid will be in excess of the operating volume. This excess fluid escapes through the by-pass port provided the pedal is correctly adjusted.

PEDAL ADJUSTMENT

Pedal adjustment is made as follows:

It is important that the piston push rod or link (Fig. 1), be adjusted for clearance where it seats in the piston. To maintain this adjustment, there should be 1/4" to 1/2" free movement of the brake pedal before the pressure starts.

Should the push rod be adjusted tightly against the piston, the by-pass port may be blocked by the cup, and the compensating action of the master cylinder will be destroyed. The primary cup must be clear of the by-pass port when the piston is in its "off" or released position. See Fig. 1.

> CAUTION: *Before removing the supply tank filler cap, extreme care must be used to prevent dirt from entering the master cylinder, as dirt lodged between the pistons and the cylinder walls may cause brake failure.*

The use of other than Genuine Nash-Lockheed Brake Fluid may cause the rubber cups and valve ports to swell and become inoperative. Grit permitted to enter the fluid reservoir will cause the cylinder barrel to become scratched and pitted. When either of these conditions is present it is necessary to remove the master cylinder for correction.

Wheel Brake Units

The wheel brake unit is composed of a dust shield assembly or support plate, two brake shoes, the wheel cylinder and brake shoe return spring. Fig. 2 shows the wheel cylinder as used on all models.

DESCRIPTION OF WHEEL CYLINDERS—All Series

The wheel cylinder shown in Fig. 2 is of the straight bore construction. The wheel cylinder is larger in diameter on the front wheels and smaller in diameter on the rear wheels.

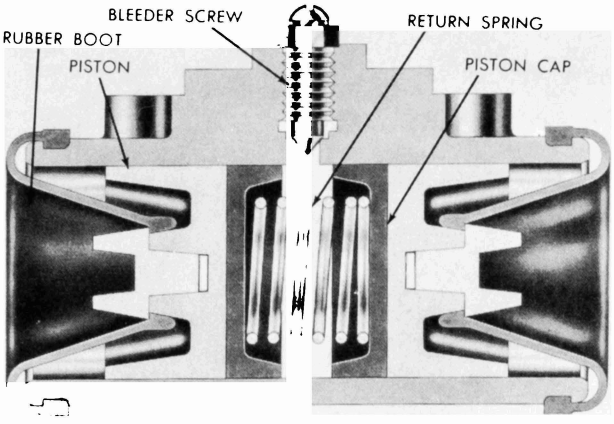


Figure 2—Wheel Cylinder.

To Remove the Wheel Cylinder

Should it become necessary to remove the wheel cylinder for inspection, the following operation should be performed:

Disconnect the cylinder from the system by removing the inlet fitting; the shoe travel is sufficient to permit the cylinder to be withdrawn without removing the brake shoes.

Inspection of Wheel Cylinder

After removing the wheel cylinder (Fig. 2) from the brake assembly, remove the boots from both ends of the cylinder. The pistons and cups are forced out of the barrel by the piston spring. Inspect the cups for ragged edges and the cylinder for smoothness. Should the cylinder be scratched or pitted, it will be necessary to have it honed to prevent loss of fluid or excessive cup wear.

When reassambling the wheel cylinder, all parts must first be washed in clean alcohol and then dipped in Genuine Nash-Lockheed Brake Fluid for lubrication. Reassemble the cups, piston and boots in the cylinder. The piston spring is installed between the piston cups. The unit is now ready for installation. New inlet fitting gaskets must be used when connecting the cylinder to the hydraulic system.

BLEEDING HYDRAULIC LINES

Whenever a tube line has been disconnected at the master cylinder, it is necessary to "bleed" the hydraulic system at all four wheels to expel all air. Whenever a line is disconnected from any individual wheel, that wheel cylinder only must be "bled."

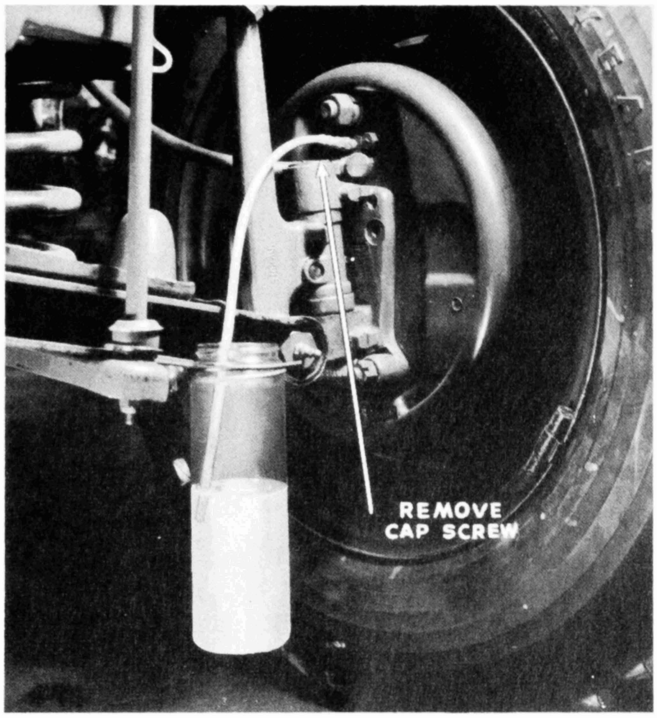


Figure 3—Brake Bleeding Operation.

Fill the master cylinder supply tank with Genuine Nash-Lockheed Hydraulic Brake Fluid before beginning this operation and keep the tank at least half full of fluid at all times. Use cylinder filler J-713N. Remove the lubrication fitting on top of the king pin, as shown in Fig. 3.

Remove the cap screw from the end of the bleeder connection as shown in Fig. 3, and screw in standard bleeder hose.

Allow the bleeder hose to hang in a clean container, such as a pint jar. Unscrew the bleeder connection ¾ of a turn and depress the foot pedal slowly by hand.

Allow the brake shoe return spring to return the pedal *slowly* to "off" position, then repeat the operation. This produces a pumping action which forces fluid through the tubing and out at the wheel cylinder, carrying with it any air that may be present.

Watch the flow of fluid from the hose, the end of which should be kept below the surface of the fluid; when all air bubbles cease to appear and when the fluid stream is a solid mass, close the bleeder connection.

It is advisable to lock the bleeder screw at the end of the last pressure stroke. Air cannot then follow possible loose threads into the cylinder during the return of the brake pedal.

Fluid withdrawn in "bleeding" operation should not be used again. Fluid should be replenished in supply tank after each wheel cylinder is "bled." Should supply tank be drained during "bleeding" operation, air will enter the system and "rebleeding" will then be necessary. When "bleeding" operation is completed, supply tank must be refilled, to within ½" from the top.

To prevent brake drag, it is necessary that the bypass port, (Fig. 1) be open when the brake pedal is in release position. See "Pedal Adjustment."

Brake Fluid

Brake fluid is prepared by the originators of Lockheed brakes, with an exact knowledge of the requirements and the danger of substitution. It is, therefore, important to use only Genuine Nash-Lockheed Brake Fluid and thus avoid damage to the brake system.

Nash-Lockheed Brake Fluid is put up in convenient containers and should be secured through the Nash Parts Department. The name "Lockheed" on the fluid can is your guarantee against substitutions.

Minor Brake Adjustment

Brakes should be adjusted when the linings have been worn to the extent that there is excessive pedal travel.

Brake drums should be approximately at room temperature when adjustments are made. If brakes are adjusted when drums are hot or expanded, the shoes may drag when the drums cool and contract.

1. Jack up all 4 wheels in a safe manner.
2. End play in the front wheel bearings should be taken up.
3. See that the parking brake lever is in the fully released position. Check the parking brake cable to see that the cable has not been adjusted too short, which would cause the shoes to move off the anchor pin seat, "partially applied." In the event that cable readjustment is found necessary, follow instructions under "Parking Brake," page 12.
4. Check the pedal adjustment to make sure the pedal pad travels approximately ¼" to ½" before the master cylinder push rod end play is taken up, and the master cylinder piston starts to move. (See Hydraulic System, page 2.)

41-42-46-4740 Series

Adjustment is made by rotating the cams "A" and "B" (Fig. 4) with a wrench until the shoes come in contact with the drum, then back off the adjustment slightly until the wheel rotates freely in either direction. Proceed in a like manner on the brake shoes of all wheels. To bring the shoes into closer relation with the drum, turn the cam towards the nearest point of the wheel rim when the wrench is pointing upward.

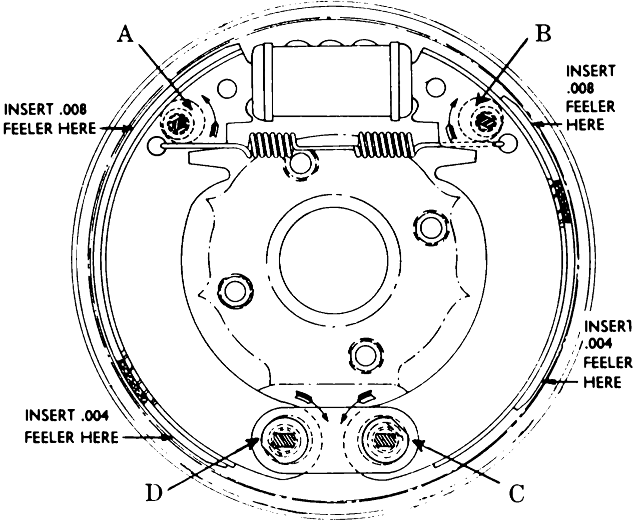


Figure 4—41-42-46-4740 Brake Adjustments.

41-4260-80, 46-47-4860 Series

Adjustment is made by the following operations at each wheel:

1. Check the anchor pin nut with a 16" wrench to make sure it is tight. If an anchor pin nut is loose, reset the anchor pin according to instructions under Major Adjustment, page 8.
2. Remove the adjusting hole cover from the backing plate (Fig. 5). Expand the brake shoes by turning the adjusting screw, with HM-13985 brake adjusting tool, toward the axle until the brake drum can just be turned by hand. Then back off the adjusting screw (moving handle of tool away from the axle) approximately 14 notches. Make this adjustment at all 4 wheels. The brake drum should then turn freely. If there is a heavy drag between shoes and drum, reset anchor pin as outlined under "Major Adjustment."
3. Reinstall the adjusting hole covers in the backing plates and lower the car.

Major Brake Adjustment—All Series

When major brake adjustments are required or brake parts renewed, it is recommended that all brake drums, all brake shoes, all shoe return springs,

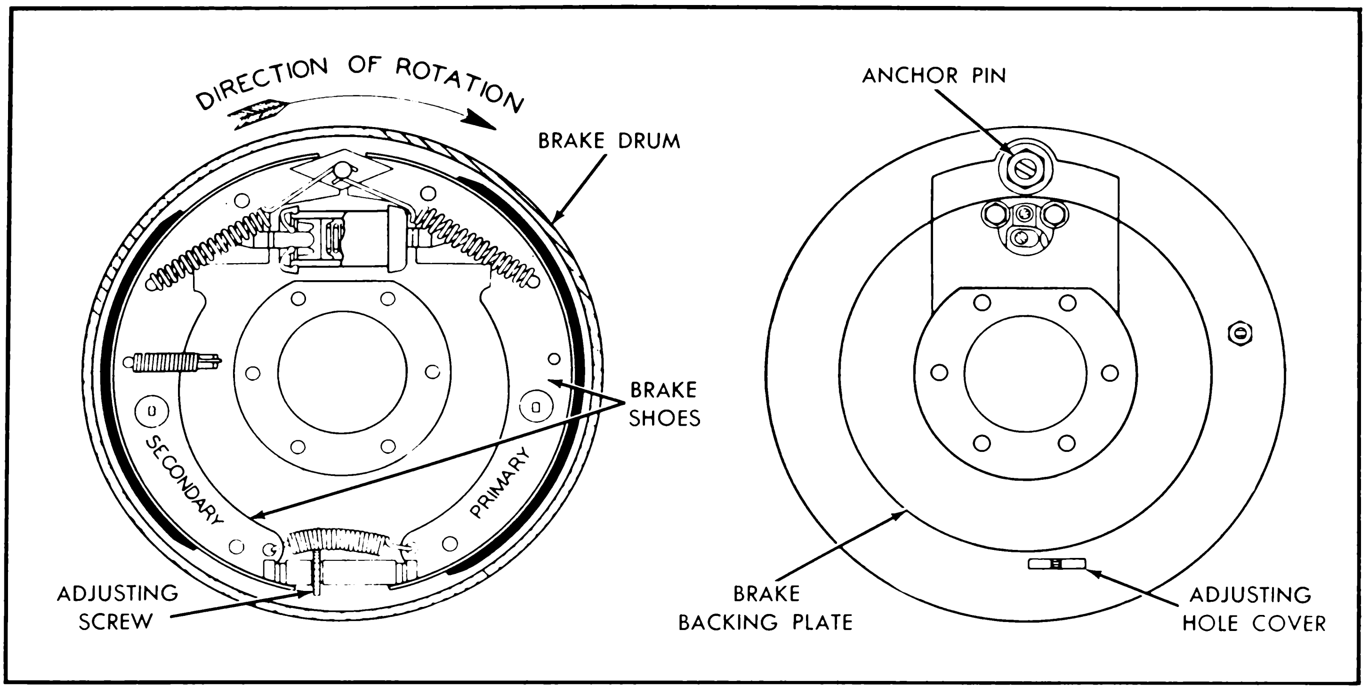


Figure 5—41-4260-80, 46-47-4860 Brake Adjustments.

and wheel cylinders be removed and inspected for wear. After cleaning all parts, brush with a stiff brush and remove dust with air. Apply a light coating of "Nash Lubriplate" to the parking brake cable connections, anchor pins and all moving parts at frictional contact points, except linings and drums.

During inspection or disassembly of brakes, the hydraulic system should be left intact so that bleeding of the lines will not be required. This is readily accomplished by disconnecting the brake shoes from the cylinder at the connecting links, without disturbing the hydraulic connections. Use piston retaining clamps KMO-145. The brake pedal should NOT be depressed while the brake drums are off.

When new lined shoes, or adjustments for wear do not produce desired results, proceed as follows:

NOTE: *Perform the following operations at each of the wheels, front and rear.*

After new lined shoes have been installed, the major adjustment procedure should be followed.

41-42-46-4740 Series

1. Insert an .008″ feeler gauge between the drum and lining as shown in Fig. 4.
2. Rotate the cam adjustment "A" (Fig. 4) in the direction of the arrow until the .008″ feeler gauge is snug.
3. Repeat operation 2 at "B" for adjustment of rear or reverse shoe.
4. Insert a .004″ feeler between the lining and drum at the anchor pin end, as shown at "D" (Fig. 4). Rotate the anchor pin in the direction of the arrow until the .004″ feeler is snug. Repeat operation at "C" (Fig. 4).
5. Recheck clearances at A, B, C, and D after all lock nuts have been tightened at these points.

A perfect lining to drum contact should not be expected until after several hundred miles of normal driving. If necessary, brakes may be given final adjustment after a short period of service.

Do not attempt to burnish, or burn in new lined shoes to a used brake drum. The result will be burned linings and distorted drums caused by extreme heat generated at these parts.

41-4260-80, 46-47-4860 Series

The following adjustments are necessary when minor adjustment fails to give satisfactory results or when replacing shoe and lining assemblies:

1. Jack up car in a safe manner and remove the hub and drum assemblies (page 5 of Rear Axle Section) for inspection of drums, linings, and brake assembly mechanism.
2. Check linings for wear and loose rivets and correct if necessary. Also, inspect linings for metal or other foreign particles imbedded in the surface and remove same. Linings soaked with lubricant or hydraulic brake fluid should be replaced.

Lubricant leakage at front or rear wheel bearings should be corrected by replacing lubrication seals. Any brake fluid leaks at the wheel cylinders should be corrected by replacing or reconditioning the cylinders.

If shoes are to be removed, use a clamp set KMO-145, to prevent the pistons from being forced out of the wheel cylinder either through the natural back pressure in the hydraulic system combined with the spring pressure between the cups, or by an accidental movement of the brake pedal. Piston ejection would cause loss of fluid and allow air to enter the hydraulic system, necessitating bleeding the system to remove all air.

3. Inspect each drum braking surface. Turn the drum down if required. The maximum amount of metal that can be removed is .030″ or 1/16″ on the drum diameter. Remove only sufficient metal to provide a true surface. If excess metal is removed, the drum may be weakened to the extent that erratic braking and rapid lining wear may result.
4. Disconnect the parking brake cable at the forward end. Point 6 (Fig. 9).
5. Thoroughly clean shoes and brake backing plates with a steel brush. All brake frictional points should be thoroughly cleaned, after which a thin coat of Nash "Lubriplate" should be applied at these points, except linings and drums.
6. Inspect bolts that hold brake support plates to steering knuckles and rear axle housing and tighten them if loose.
7. When newly lined shoes are installed, it is necessary to back off on the adjusting screw to provide clearance for drum installation. After new lined shoes have been installed, the major adjustment procedure should be followed.

Adjust Anchor Pin

When it is necessary to adjust the anchor pin, loosen the lock nut (Fig. 5) one full turn, turn the adjusting nut (Fig. 5) until the brake shoes are against the drum, tap the lock nut with a hammer upward towards the drum until brake drum drags, back off the adjusting nut (Fig. 5) several turns and insert a .015 feeler gauge to get the necessary clearance *all around.* Tighten the lock nut with a 16″ wrench, and again check both shoes for .015″ clearance to be certain the anchor pin has not moved.

NOTE: *Do not connect front end of cable at this time.*

8. Before reinstalling front hub and drum assemblies, remove excess grease from inside the hub and hub cap to prevent grease leakage onto the brake assembly and lining. To lubricate front wheel bearings, apply a high grade wheel bearing grease to the bearings and races only. The type of lubricant recommended by Nash should be used.
9. Insert a .015″ feeler gauge between the secondary shoe lining and drum, then check lining to drum clearance at each end of the secondary shoe. Use brake feelers, Tool J-1417A. A clearance of .015″ at each end of the secondary shoe with the primary shoe against the opposite side of the drum indicates good positioning of the anchor pin and adjusting screw. If a .015″ clearance cannot be obtained at both ends of the secondary shoe by rotating the adjusting screw, the anchor pin must be adjusted.
10. Check the level of lubricant in the rear axle housing (at differential). This should not be above the lower edge of the filler plug hole. Too high a level will cause lubricant leaks at rear wheel lubrication seals. Excessive looseness at rear wheel bearings should be corrected.

NASH HYDRAULIC FLOATING SHOE BRAKE—4840 Series

Description

In this brake, the shoes, instead of being mounted on a fixed anchor pin, rest on the parallel edges of an anchor plate which is attached to the brake backing plate. This type of mounting permits the shoe to float with the brake drum during a brake application. Both the anchor plate and the shoe end are hardened. A conventional hydraulic wheel cylinder, 1″ in diameter for front wheels and 7/8″ in diameter for rear wheels, spreads the shoes at the upper end. Friction-locked eccentrics are provided for adjusting the brakes to compensate for lining wear. The new brake shoes are 2 inches wide. The linings are 10 inches long primary, and 7½ inches long secondary, 1¾ inches wide, and are riveted to the shoes.

Another advantage of the floating-shoe principle is that it does not require a so-called major adjustment. In the conventional anchored shoe brake, this major adjustment consists of adjusting the eccentrics *and* the anchor pins to obtain the proper clearance between the shoes and the drum in the released position.

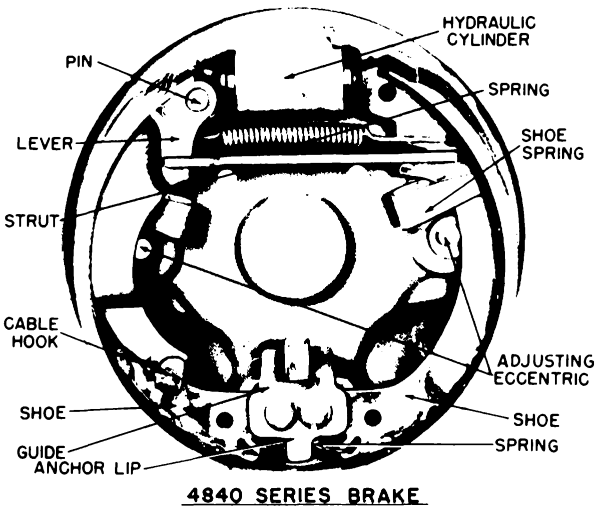


Figure 6—4840 Rear Brake Shoe.

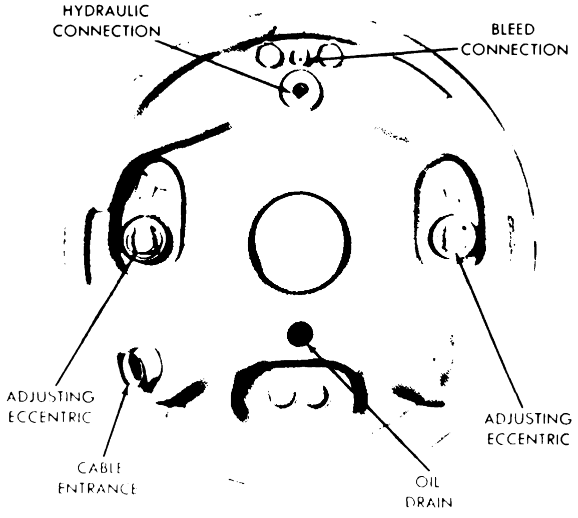


Figure 7—4840 Brake Adjusters.

Two coil springs (Fig. 6) hold the shoes against the wheel cylinder pistons and the anchor. The long upper spring is the brake shoe return spring. The short lower spring holds the shoes to the anchor. There is a flat clip shoe spring that holds the shoes to the support plate.

In the floating shoe brake, the only adjusting operation is to turn the eccentrics (Fig. 7) until the shoes are tight in the drum, then back them off until a free wheel rotation is obtained. Since they are able to slide on the anchor plate, the shoes find their own center in the drum.

Adjustment to Compensate for Lining Wear

1. Jack up all four wheels in a safe manner.
2. Take up end play in the front wheels.
3. See that the parking brake lever is in the fully released position and that all wheels are free.
4. Make certain that the brake pedal moves 1/4″ to 1/2″ from its released position before pressure is applied to the hydraulic fluid in the system. To obtain free movement of the brake pedal, adjust the rod connecting the brake pedal to the master cylinder. (See Hydraulic System, page 4.)
5. Make a hard brake application and release the pedal.
6. At each wheel, turn the eccentric controlling the front shoe in the normal forward direction of wheel rotation using a 3/8″ socket (RM-412 Snap-on) until the entire lining surface contacts the drum. With the noticeable drag, rotate the wheel slightly in the forward and reverse direction to allow the shoe to center itself. Then turn the eccentric in the opposite direction until the drum is free. Turn the eccentric which controls the rear shoe adjustment toward the rear or opposite the normal forward rotation of the wheel until the shoe is tight against the drum. Once again rotate the wheel slightly in the forward and reverse direction to center the rear brake shoe to the drum. Then back off slightly on the eccentric until the wheel is free to rotate.
7. Lower car to floor and road test.

Adjustment When New Shoe and Lining Assemblies Are Installed

1. Jack up all four wheels in a safe manner.
2. Remove wheels and hub and drum assemblies.
3. Disconnect brake cable at both rear brakes.
4. Disconnect springs, remove shoe and lining assemblies from support plates.
5. The support plates should be cleaned and a light coating of lubriplate applied to the ends of the shoes and shoe contacts on the support ledges, the flat pressure spring contacts on the shoes, the eccentrics, parking brake strut and lever pin (Fig. 6).

CAUTION: *Do not over lubricate as excessive lubricant may be deposited on the brake linings.*

6. Install new shoe and lining assemblies and all other necessary brake parts. Connect the cable at each rear brake. Reassemble the hub and drum assemblies.

7. Make certain that the brake pedal has ¼″ to ½″ travel before pressure is exerted on the hydraulic fluid.
8. Make hard brake application and release the pedal.
9. Adjust the brake shoes following the same procedure used for adjustment to compensate for lining wear.
10. With the parking brake lever in the fully released position, adjust cable equalizer so that at least a ⅛″ free movement is attained at the rear brake cable levers.
11. Lower car to floor and road test.

Brake Squeak—All Series

Brake squeak in most cases is the result of a brake shoe loose on the anchor pins or in the guides. Improper adjustment of the shoes to the brake drum will cause a vibration at the loose end of the shoe, resulting in a brake squeak, just before the car comes to a stop.

4840 Series

If squeaks occur in this brake, it may be due to the bottom portion of the brake shoes not being retained squarely on the brake support ledges during brake applications (Fig. 6). The anchor spring or the short lower coil spring beneath the anchor lip must retain sufficient tension to hold the brake shoe in constant contact with the brake support and prevent side movement of the brake shoes (see Fig. 6). This is accomplished by bending the anchor lip slightly toward the brake support plate so that 15 lbs. pressure may be exerted through the coil spring to retain the shoe on the ledges. To determine the amount of pressure being exerted it may be measured by attaching a spring scale to the web at the end of the brake shoe and by pulling outward until the shoe is lifted from the brake support plate.

CAUTION: *Care must be exercised in bending the anchor lip so that you do not exceed 15 lbs. pressure. Excessive pressure at this point will prevent the brake shoes from centering*

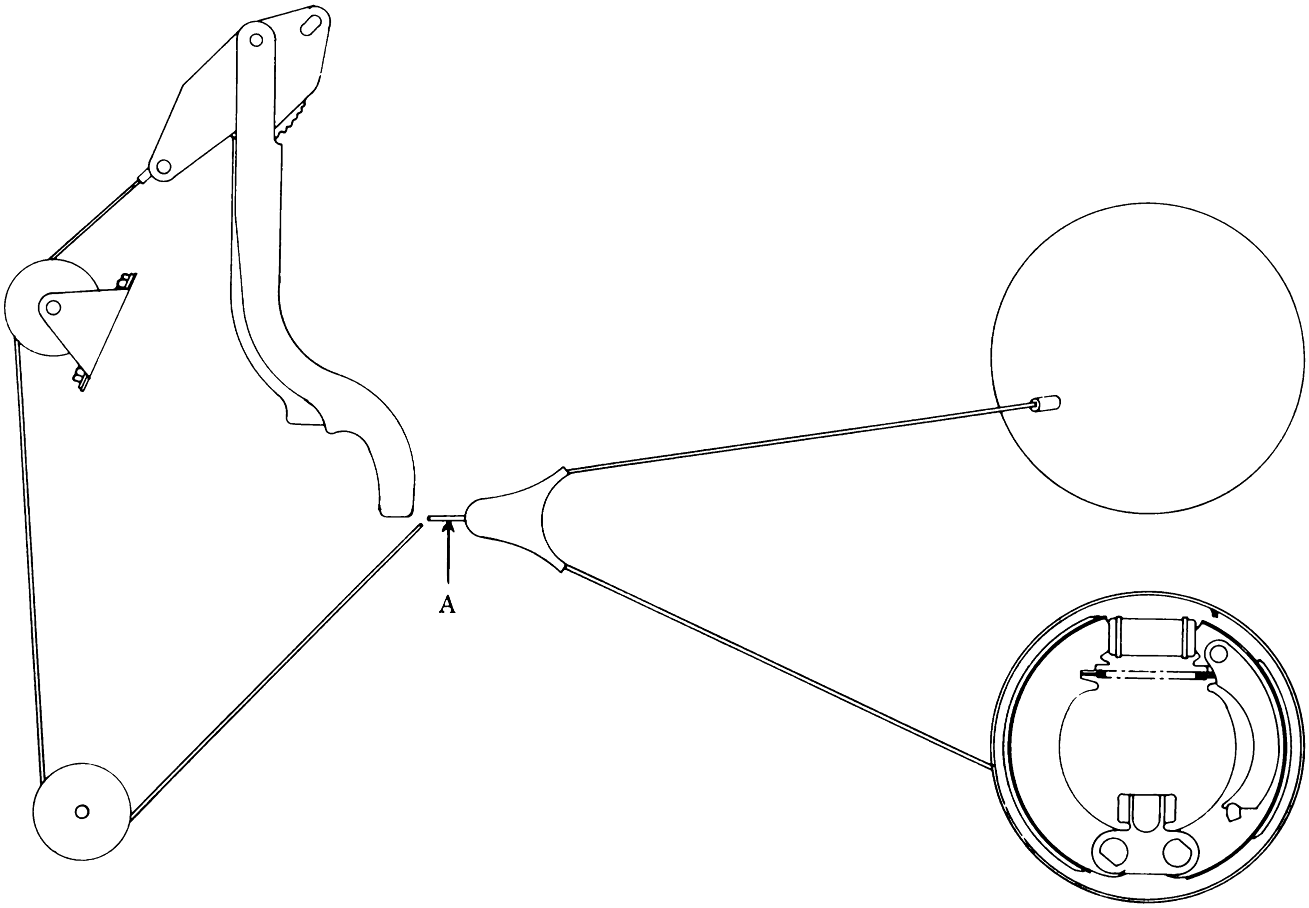


Figure 8—41-42-46-47-4840 Parking or Hand Brake Layout.

themselves through normal road vibrations. This would cause a brake drag after the brake pedal was released.

Brake linings, through normal brake applications, acquire a glazed condition—a surface that is considered satisfactory and should not be disturbed. It is only necessary to remove the dust accumulation and apply the aforementioned procedure to obtain quiet brake operation.

Front Brake Hose

When a new brake hose is installed it is important that it be held in the proper position when it is connected to the brake line, to prevent a possible contact with the tire.

Lubrication of Full Floating Brake Shoes

It is very important that the shoes in this brake be free to move so that they will center themselves with the drum on brake application.

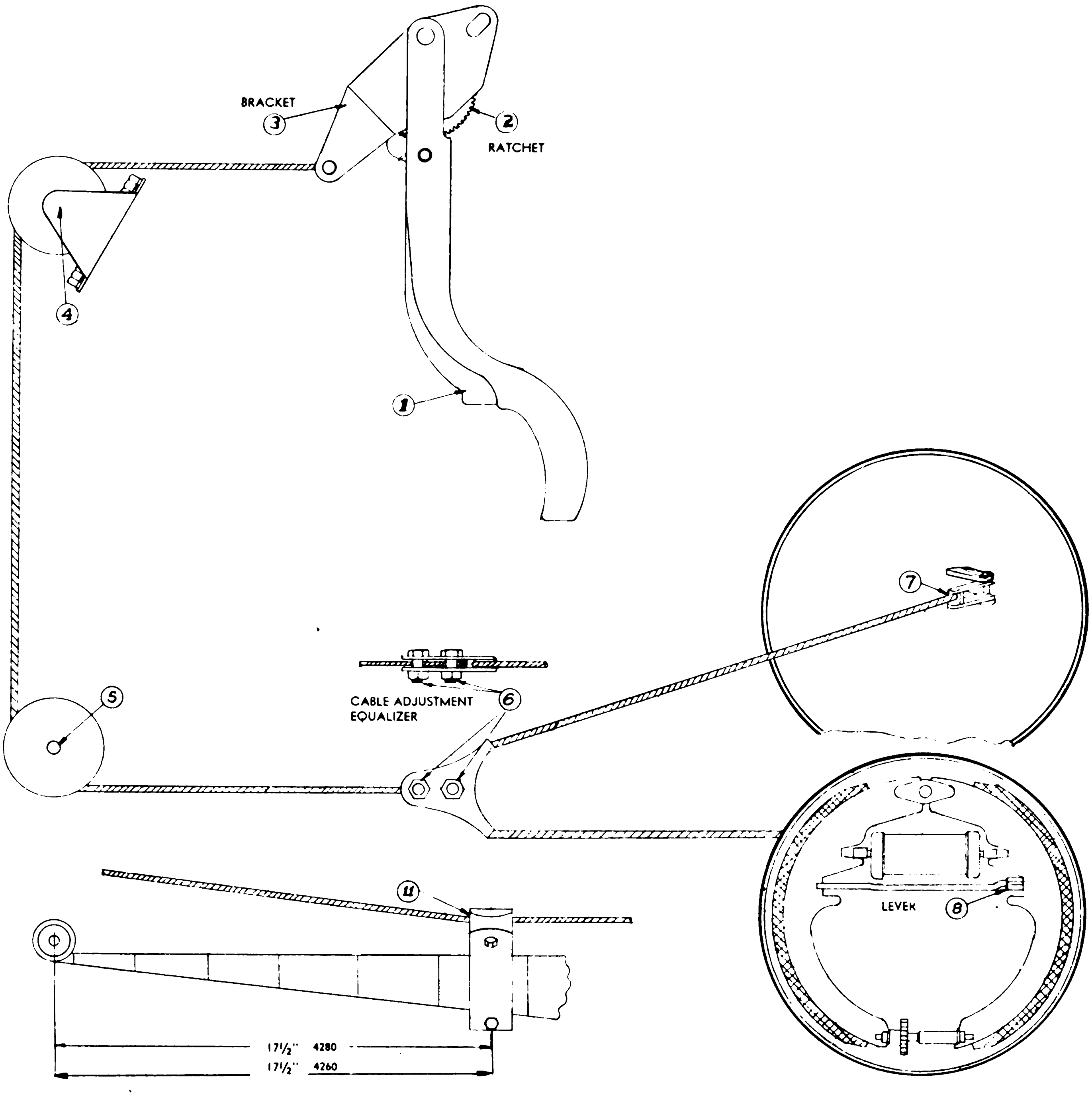


Figure 9—41-4260-80, 46-47-4860 Parking or Hand Brake Layout.

Whenever brake drums are removed the shoes and brake support plates should be cleaned thoroughly. Then coat the following with a light coating of Lubriplate: the ends of the shoes that contact the anchor pin and the support plate edges, the flat pressure spring contacts on the shoes, the eccentrics that contact the shoes and the parking brake strut and lever pin.

PARKING BRAKE OR HAND BRAKE

Description

The parking brake is operated by a lever below the instrument panel on the left side of the driver's compartment. Its purpose is to prevent the movement of the car, holding it stationary even when parked on an incline.

The parking brake lever applies the shoes in the rear wheel brakes by means of cables connected between the hand lever and the rear brake support plates.

The parking brake is most easily applied or released by first depressing the foot brake pedal to its full travel, then applying or releasing the hand brake with its ratchet lock.

HAND BRAKE ADJUSTMENT

41-42-46-47-4840 Series

To adjust the hand brake on these series proceed as follows:

1. Loosen the lock nut at (A) (Fig. 8) and pull the hand brake lever back two notches.
2. Remove all slack from the cables, the one leading to the hand lever and the one leading to the rear brake. Then tighten the lock nut at (A).
3. Release the hand brake operating lever to its full released position which will put a little slack in each cable.

CAUTION: *Make sure that both rear wheels are free to turn when the hand brake is in its released position.*

41-4260-80, 46-47-4860 Series

1. Pull the operating lever back two notches. Loosen the cable adjusting clamp at Point 6 (Fig. 9).
2. Remove all the slack from the cables leading to the hand brake lever and to the rear brakes. Then tighten the cable adjusting clamp.
3. Release the hand brake operating lever to its full released position, which will put a little slack in the cables.

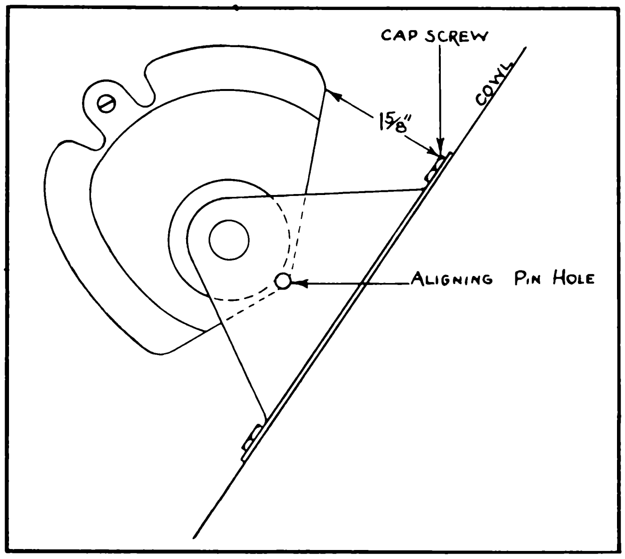


Figure 10—Hand Brake Pulley Adjustments.

4. Check the movement of the operating lever at each rear wheel brake to see that there is at least ⅛″ free movement. This is important. Lack of free movement at this point will result in a dragging brake.

If for any reason the hand brake cable guide, located on the rear spring, is removed, it is important that it be replaced in the proper position to assure the correct angle of the cables. This guide should be located on the rear spring so that the center of the clamp bolt is 17½″ from the center of the front spring eye. (See Fig. 9.)

HAND BRAKE PULLEY ADJUSTMENT

46-47-4840-60 Series

When adjustment is made to the hand brake pulley, the hand brake lever should be located in the fully released position. With the cable clamp loosened, the pulley should be located so as to provide a 1⅝″ clearance between the top rear edge of the pulley and the head of the bracket to dash screw (Fig. 10). Readjust the cable as per instructions under Handbrake Adjustment, outlined above.

Starting with Serial No. K-170055 and No. R-451662

An aligning pin hole has been provided in the hand brake pulley bracket, to accommodate the J-1390

Gear Shift Aligning Pin. Refer to page 2, Shifting System Section.

This method of alignment is designed only to provide uniform location of the pulley; all service adjustments made thereafter being at the brake adjusting yoke.

CAUTION: *This adjustment is NOT TO COMPENSATE FOR cable stretch or brake lining wear. Its only purpose is to position the pulley correctly.*

BRAKE FAILURE DIAGNOSIS

A. Pedal Goes to Floor Board

Cause:

1. Normal or abnormal wear of lining.
2. Leak in system.
3. Air in system.
4. No fluid in supply tank.

Remedy:

1. When brake linings become worn, it is necessary to set the shoes into closer relation to brake drums. This condition is usually accompanied by advice from the driver that it is necessary to PUMP the pedal before a braking action is obtained. Shoes should be set as close to brake drums as possible without drag. Do not disturb the anchor pins when making this adjustment. Adjustment must be made while the drums are cool.

2. A connection leak in the system will allow the pedal to go to the floor board, under pressure. A cup leak does not necessarily result in loss of pedal travel, but will be indicated by a loss of fluid in the supply tank. If no leaks are found at wheels or connections, remove the master cylinder and check the bore of the barrel for score or scratches.

3. Air in the system will cause a springy, rubbery action of the pedal. Should a sufficient quantity of air be introduced into the system, the pedal will go to the floor board on brake application, and the system should be bled.

4. Add Fluid and bleed the brake system.

B. When All Brakes Drag

Cause:

1. Mineral oil in system.
2. By-pass port hole closed.

Remedy:

1. The introduction into the system of any oil of a mineral base, such as engine oil, kerosene, or the like, will cause the cups to swell and distort, making it necessary to replace all rubber parts. After replacing these parts, flush the system with alcohol and refill with genuine Nash-Lockheed Brake Fluid.

2. Directly ahead of the master cylinder piston primary cup (when in normal release position) is a by-pass or compensating port. It is imperative that the by-pass port be open when the brakes are released. Should the by-pass port (Fig. 1) be blocked by the piston primary cup, a fluid pressure will gradually build up and thus cause the brakes to drag or lock. Opening a bleeder screw will allow built-up pressure to escape and give temporary relief. The bleeder screw must then be tightened before the car is driven.

C. When One Wheel Drags

Cause:

1. Weak brake shoe return spring.
2. Brake shoe set too close to drum.
3. Wheel cylinder cups distorted.
4. Loose wheel bearings.

Remedy:

1. Springs sometimes lose their contracting power and take a set. Replace spring.

2. Readjust shoes to proper clearance.

3. If in the repair of wheel cylinders, kerosene, gasoline and other fluids are used as cleaners instead of alcohol, the cups will swell and distort. The return action of the shoes will be retarded and the brake drum will heat. Replace cups and wash the unit in alcohol and dip all parts in brake fluid before reassembling.

4. Tighten wheel bearings.

D. Car Pulls to One Side

Cause:

1. Oil-soaked brake lining.
2. Shoes improperly set.
3. Backing plate loose on axle.
4. Different makes of lining.
5. Tires not properly inflated.

Remedy:

1. Replace with new Nash factory lined shoes. Grease-soaked linings cannot be salvaged by washing or cleaning.

2. Adjust the shoes to proper clearance.

3. Loose brake support permits the brake assem-

bly to shift on the locating bolts. This shifting changes the predetermined centers and causes unequal efficiency. Tighten the backing plates and readjust the shoes.

4. Different makes of linings have different braking efficiency. Two different makes, one with high efficiency and one with low efficiency, would cause the car to pull to one side. Use genuine Nash lined shoes on all wheels.

5. Inflate tires to recommended pressure.

E. Springy, Spongy Pedal

Cause:

1. Brake shoes not properly adjusted.
2. Air in system.

Remedy:

1. Adjust brakes.
2. Bleed brakes.

F. Excessive Pressure on Pedal, Poor Stop

Cause:

1. Brake shoes not properly adjusted.
2. Improper lining.
3. Oil in lining.
4. Lining making partial contact.

Remedy:

1. Adjust brakes.
2. Replace with new Nash lined shoes, as improper grades of brake linings lose their gripping qualities after a few thousand miles.
3. Replace with Nash Factory lined shoes.
4. Remove high spots.

G. Light Pressure on Pedal, Severe Brakes

Cause:

1. Brake shoes not properly adjusted.
2. Loose backing plate on axles.
3. Grease-soaked lining.

Remedy:

1. Adjust brakes.
2. Tighten backing plates. Adjust shoes.
3. Grind off lining to remove grease or replace with new linings.

Nash Lined Brake Shoes

Factory lined shoes are supplied to assure the most satisfactory brake condition. In using them there is the certainty that shoes are not distorted, that linings fit, are properly riveted to the shoe and are of the correct type and finished contour. Nash linings are ground to dimensions that compensate for drum wear and require the minimum equipment for installation.

The use of Nash factory lined shoes is urged to insure owner satisfaction.

WHEELS AND TIRES SECTION

WHEELS AND TIRES

Tire Pressure

Correct tire pressures are to a large extent responsible for the driving stability of a car, particularly at speeds above 50 miles per hour. For maximum stability, all tires should be inflated so that the deflection of all the tires is the same under the load that the car is carrying.

Tires should be inspected for the correct pressures at least once a week during hot weather.

Rotation of Tires

To equalize tire wear it is recommended that the tires be interchanged after every two to three thousand miles of service. Follow the rotation procedure as outlined in Fig. 11.

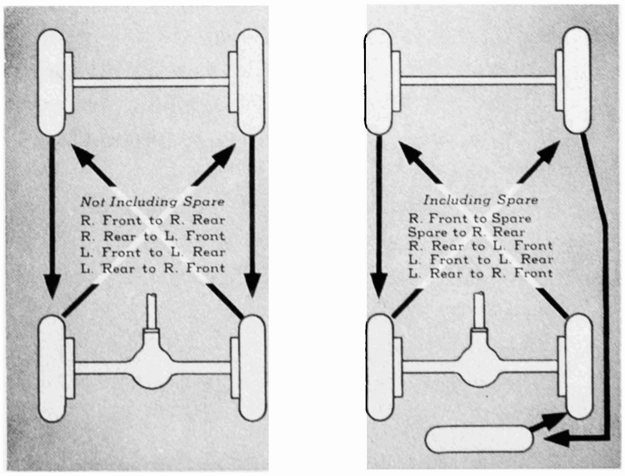


Figure 11—Tire Rotation—All Series.

Wheel Balance

Tire and wheel balance is very important both for preventing excessive tire wear and for ease in handling the car. All wheels and tires are balanced at the factory before they are installed on the car, but tire wear and repair will affect the balance of wheels so that they should be rebalanced after every tire change or tube repair.

Front Wheel Bearing Adjustment

For adjustment of the front wheel bearings the car should be jacked up so that the wheels are free from the ground.

1. Remove the hub cap, the inner cap and the cotter pin.
2. Remove the wheel spindle nut and remove the wheel from the wheel spindle.
3. Thoroughly clean, inspect and repack the wheel bearings, with the recommended type of wheel bearing grease every 10,000 miles.
4. Install the wheel on the spindle and rotate the wheel as the nut is being tightened, until there is a drag on the wheel.
5. Back off on the wheel spindle nut far enough to expose the cotter pin hole (one castellation). This adjustment should allow the wheel to turn freely, without end play in the wheel bearings.
6. Insert the cotter pin. Always use a new pin and clinch it over so that it will not interfere with the inner cap. Install the inner cap and hub cap. Lower the wheel to the floor.

Rear Hub and Bearing Inspection

Rear hubs have the same size brake drums as the front with the same stud arrangement. The hub center is tapered to fit the taper of the axle shaft. A key-way in the hub matches the key-way in the shaft.

Use hub puller J-1644, adaptable to different series, to pull the rear wheel hub. *Never Use a Wheel Knock Out.* In the removal of rear wheel hubs, the pulling effort should be away from the axle shaft. Damage to the differential thrust block will result if the rear wheel hub is pulled in any other manner.

Refer to page 5 of the Rear Axle Section for the procedure for removing hubs.

Rear Wheel Bearing Inspection

Follow the procedure outlined on page 6 of the Rear Axle Section for the removal of the rear backing plate, axle shafts and bearings.

Bearings

Bearings must be handled with the greatest of care because very few bearings removed during the course of service work will be free of dirt or other foreign matter. In some cases there is enough dirt to affect the "feel" of a bearing.

After bearings have been removed *DO NOT SPIN THEM,* either by hand or with compressed air. Wrap them in a clean cloth or paper and set them aside until they can be washed.

To wash a bearing submerge it in a cleaning solution that is absolutely free of dust. Rotate the bearing to flush away the old oil and dirt. Dry the bearing with care.

Now examine the bearing to be sure that it is free-rolling and has no cracked races or damaged balls.

Replacing Axle Shafts, Bearings and Brake Backing Plates

Refer to page 19 of the Rear Axle Section.

Rear Axle Bearing Lubrication and Adjustment

Refer to page 20 of the Rear Axle Section for bearing adjustments.

> CAUTION: *The 47-4840-60 Series rear axles do not have provision for lubricating the rear wheel bearings after assembly. Therefore, on these series the rear wheel bearings will have to be packed with the correct wheel bearing lubricant before assembling the brake backing plate.*

Installing Rear Wheel Hubs

Refer to page 20 of the Rear Axle Section.

> CAUTION: *Any movement between the rear wheel hub and the axle shaft will cause a clicking noise noticeable when the direction of the wheel is reversed. If this looseness is not corrected, oil will work in between the tapers of the hub and shaft, making it impossible to tighten the axle nut enough to remove the clicking noise. If this has happened, remove the hub and clean the tapers of the hub and the axle shaft with gasoline. Install the cleaned parts perfectly dry, then tighten the axle nut to the recommended torque specifications:*

AXLE NUT TIGHTENING SPECIFICATIONS

40 Series	160 ft. lbs. to 165 ft. lbs.
60 Series	180 ft. lbs. to 190 ft. lbs.
80 Series	180 ft. lbs. to 190 ft. lbs.

BRAKES SPECIFICATIONS

Year Series	**4140**	**4240**	**4640**	**4740**	**4840**
Type of Mechanism	Lockheed Hydraulic	Lockheed Hydraulic	Lockheed Hydraulic	Lockheed Hydraulic	Lockheed Hydraulic
Make	Bendix Non-Servo	Bendix Non-Servo	Bendix Non-Servo	Bendix Non-Servo	Bendix Floating Shoe
Total Foot Braking Area	143.5 Sq. In.	143.5 Sq. In.	143.5 Sq. In.	143.5 Sq. In.	132 Sq. In.
Clearance, Toe	.008″	.008″	.008″	.008″	.010″
Clearance, Heel	.004″	.004″	.004″	.004″	.010″
Pedal Free Play	¼″ to ½″	¼″ to ½″	¼″ to ½″	¼″ to ½″	¼″ to ½″
Drum Diameter	9″	9″	9″	9″	9″
Lining Width	1¾″	1¾″	1¾″	1¾″	2″ Forward 1¾″ Rev.
Lining Thickness	3/16″	3/16″	3/16″	3/16″	3/16″
Wheel Cylinder	Straight Bore	Straight Bore	Straight Bore	Straight Bore	Straight Bore
Front Wheel Cylinder Diameter	1″	1″	1″	1″	1″
Rear Wheel Cylinder Diameter	⅞″	⅞″	⅞″	⅞″	⅞″
Master Cylinder Bore	1″	1″	1″	1″	1″
Piston Clearance, Wheel & Master Cylinder	.001″ to .003″	.001″ to .003″	.001″ to .003″	.001″ to .003″	.001″ to .003″
Hand Brake Location	Rear Service Brake	Rear Service Brake	Rear Service Brake	Rear Service Brake	Rear Service Brake
Year Series	**4160** **4180**	**4260** **4280**	**4660**	**4760**	**4860**
Type of Mechanism	Lockheed Hydraulic	Lockheed Hydraulic	Lockheed Hydraulic	Lockheed Hydraulic	Lockheed Hydraulic
Make	Bendix Servo	Bendix Servo	Bendix Servo	Bendix Servo	Bendix Servo
Total Foot Braking Area	176 Sq. In.	176 Sq. In.	176 Sq. In.	176 Sq. In.	176 Sq. In.
Clearance, Toe	.015″	.015″	.015″	.015″	.015″
Clearance, Heel	.015″	.015″	.015″	.015″	.015″
Pedal Free Play	¼″ to ½″	¼″ to ½″	¼″ to ½″	¼″ to ½″	¼″ to ½″
Drum Diameter	10″	10″	10″	10″	10″
Lining Width	2″	2″	2″	2″	2″
Lining Thickness	3/16″	3/16″	3/16″	3/16″	3/16″
Wheel Cylinder	Straight Bore	Straight Bore	Straight Bore	Straight Bore	Straight Bore
Front Wheel Cylinder Diameter	1 1/16″	1 1/16″	1 1/16″	1 1/16″	1 1/16″
Rear Wheel Cylinder Diameter	1″	1″	1″	1″	1″
Master Cylinder Bore	1⅛″	1⅛″	1⅛″	1⅛″	1⅛″
Piston Clearance, Wheel & Master Cylinder	.001″ to .003″	.001″ to .003″	.001″ to .003″	.001″ to .003″	.001″ to .003″
Hand Brake Location	Rear Service Brake	Rear Service Brake	Rear Service Brake	Rear Service Brake	Rear Service Brake

WHEEL AND TIRE SPECIFICATIONS

Year Series	**4140**	**4240**	**4640**	**4740**	**4840**
Wheel Size	16x4″	16x4″	16x4″	16x4″	15x4½″
Tire Size, Standard	5.50x16	5.50x16	6.00x16	6.00x16	6.40x15
Tire Size, Optional	6.00x16	6.00x16			
Tire Pressure, Front Tires	28 lbs.	28 lbs.	25 lbs.	25 lbs.	24 lbs.
Tire Pressure, Rear Tires	28 lbs.	28 lbs.	25 lbs.	25 lbs.	24 lbs.

Year Series	**4160**	**4260**	**4660**	**4760**	**4860**
Wheel Size	16x4½	16x4½	15x4½	15x4½	15x5
Tire Size, Standard	6.25x16	6.25x16	6.50x15	6.50x15	7.10x15
Tire Pressure, Front Tires	28 lbs.	28 lbs.	28 lbs.	28 lbs.	24 lbs.
Tire Pressure, Rear Tires	28 lbs.	28 lbs.	28 lbs.	28 lbs.	24 lbs.

Year Series	**4180**	**4280**			
Wheel Size	16x5	16x5			
Tire Size, Standard	6.50x16	6.50x16			
Tire Pressure, Front Tires	26 lbs.	26 lbs.			
Tire Pressure, Rear Tires	26 lbs.	26 lbs.			

REAR AXLE AND PROPELLER SHAFT SECTION

Nash

TECHNICAL MANUAL

DIAGNOSING AXLE TROUBLES

DIAGNOSING AXLE TROUBLES 3

DISASSEMBLING NASH REAR AXLES 5

Removing the Axle 5
Setting Up the Axle 5
Pulling the Hubs 5
Removing the Brake Backing Plates 6
Pulling the Axle Shafts 6
Inspecting the Axle Housing 6
Removing the Differential 7
Pulling the Differential Side Bearings 8
Removing the Ring Gear 8
Removing the Spider Gear and Shaft 8
Inspecting Differential Parts 9
Removing the Pinion Gear and Shaft 9
Pulling the Pinion Bearing and Adjusting Washer 10
Inspecting the Pinion Gear and Shaft Assembly 11
Cleaning Parts 11

ASSEMBLING NASH REAR AXLES 11

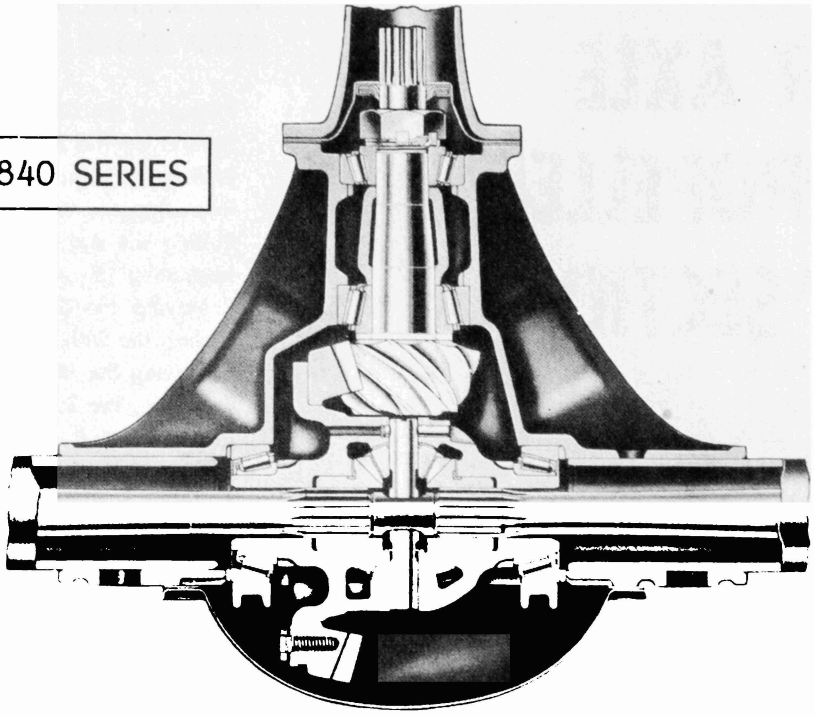
Assembling the Differential 11
Replacing the Differential Side Bearings 12
Adjusting the Side Bearings 12
Installing the Ring Gear 13
Installing the Pinion Gear and Shaft 13
Pre-loading Pinion Bearings 15
Testing Ring Gear and Pinion Backlash 16
Pre-loading Differential Side Bearings 17
Installing the Differential Assembly 18
Inspecting Tooth Contact 18
Replacing Axle Shaft Bearings 19
Installing the Axle Shafts 19
Installing the Brake Backing Plates 20
Adjusting Axle Shaft End Play 20
Installing the Wheel Hub 20
Winding Up the Job 21
Final Inspection 21

PROPELLER SHAFT SECTION 21

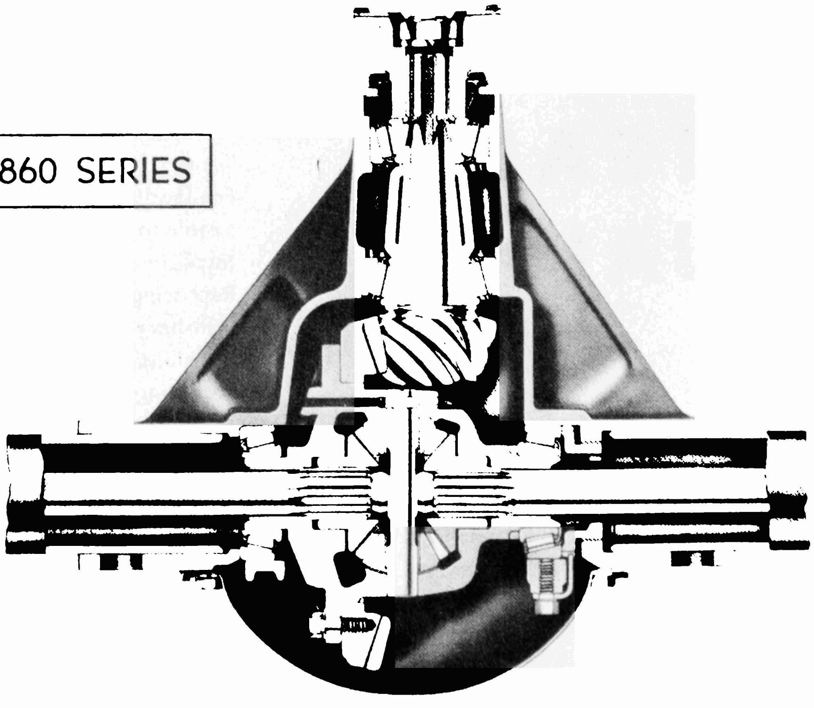
SPECIFICATIONS FOR NASH REAR AXLES 26

DIFFERENTIAL AND FINAL DRIVE GEARS
NASH REAR AXLES

47-4840 SERIES



47-4860 SERIES



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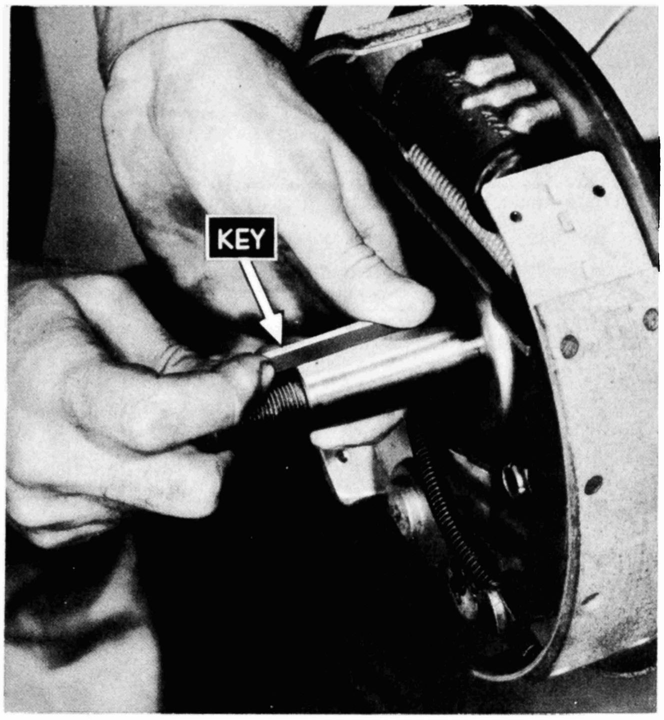


Figure 42—The key should fit smoothly and tightly into the Axle Shaft keyway.

Finally put on the thrust washer and axle nut, and tighten the nut. Of course, after the axle has been installed on the car, you'll want to tighten the axle nuts again so you can be sure they're good and tight.

COMPLETING THE ASSEMBLY

After the axle has been installed on the car, fill the axle with hypoid lubricant. For complete and correct lubrication of Nash rear axles, refer to your lubrication chart.

While the car is on the lube hoist, make sure the vent in the housing is clear, because if plugged pressure may form in the housing and cause oil seal failure.

FINAL INSPECTION—All Series

When the job has been completed—the axle has been disassembled, inspected, corrected, reassembled, and lubricated — give it another thorough road test and inspection as detailed in the first part of this manual section.

Give it the four tests to be sure it operates smoothly and quietly under all conditions.

Then, if it checks out okay, it's ready to be turned over to the customer.

Note

4840-4860 Series Rear Axles are the same as the 4740-4760 with the exception of gear ratios. See Rear Axle Specifications (page 26).

PROPELLER SHAFT SECTION

PROPELLER SHAFT AND UNIVERSAL JOINTS

1. *Description*

Engine power is delivered from the transmission to the rear axle and wheels through a rotating propeller shaft. In order that the rear axle will move up and down freely a universal joint is used in this drive line.

2. *41-42-46-47-4840 Series, Torque Tube Drive*

The torque tube is the member between the transmission and the rear axle. In this type of construction the propeller shaft is suspended in the tube and transfers the torque created by the engine to the rear axle and into car motion. This is known as Torque Tube Drive.

Torque Tube Removal—41-42-46-47-4840 Series

Raise rear end of car and locate supports under the body or at both bumper brackets.

Remove the hand brake pulley at the body side sill.

Loosen rear spring seats at the axle to avoid damage to shock absorbers in the way of bent bayonet ends.

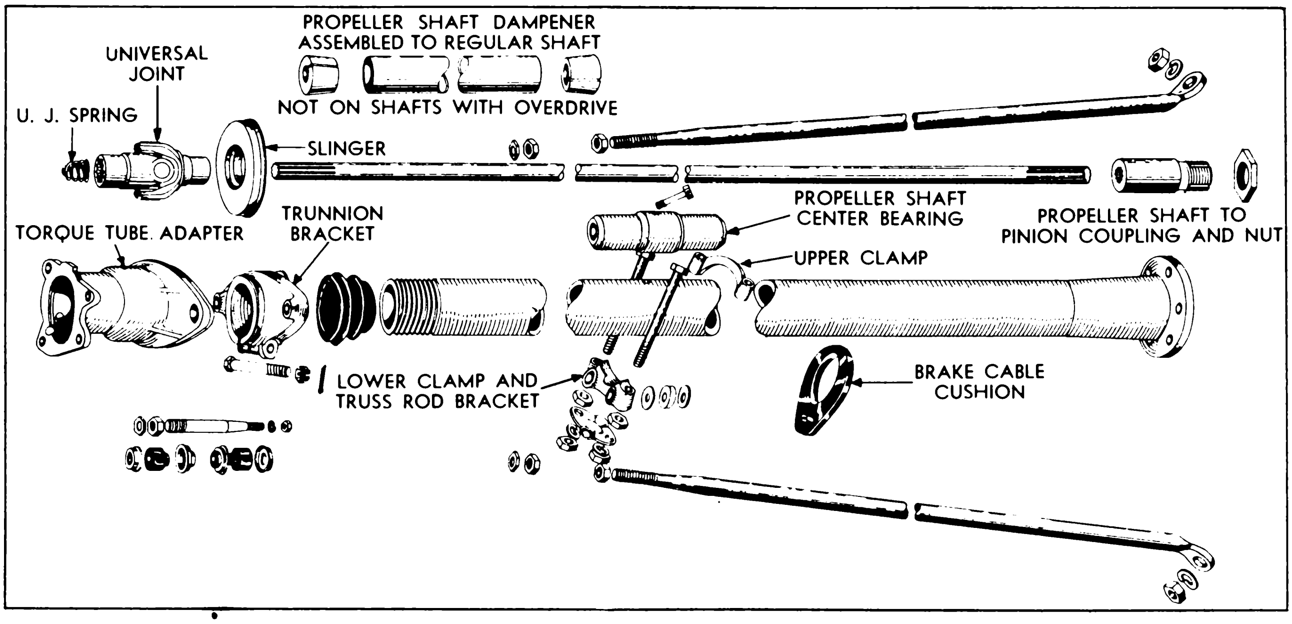

PROPELLER SHAFT DAMPENER
ASSEMBLED TO REGULAR SHAFT
UNIVERSAL JOINT
NOT ON SHAFTS WITH OVERDRIVE
U. J. SPRING
SLINGER
PROPELLER SHAFT
CENTER BEARING
TRUNNION BRACKET
TORQUE TUBE ADAPTER
PROPELLER SHAFT TO PINION COUPLING AND NUT
UPPER CLAMP
LOWER CLAMP AND TRUSS ROD BRACKET
BRAKE CABLE CUSHION

Figure 43—41-42-46-47-4840 Torque Tube and Propeller Shaft in Assembly Sequence.

Disconnect body stabilizer bar at the axle end. Disconnect torque tube truss rods at the center bracket. (Fig. 43.)

Disconnect the trunnion bracket from the adapter by removing the front nuts, bushings and retainers from the dowel studs. Move the tube and axle back to clear the studs. The universal joint which is a light press fit may be pried from the propeller shaft. The torque tube may now be disconnected from the axle flange and moved forward. The propeller shaft can now be disconnected at the propeller shaft to pinion coupling.

Propeller Shafts—41-42-46-47-4840 Series

Shafts are splined at each end; the front for the universal joint, which is a light press fit; the rear for the pinion coupling, which is a tight press fit.

41-4240 Series

Cars not equipped with overdrive have a longer shaft. On this shaft is assembled a tube type dampener. (Fig. 43.) The tube is located ahead of the center bearing and is clinched to split bushings which have been forced into the tube and are secured to the propeller shaft under extreme friction pressure. If necessity requires the removal of a dampener tube from the propeller shaft, the shaft may be re-installed without the tube. The tube dampener functions during approximately the first 1,000 miles of driving and if removed in service after this it need not be replaced.

Propeller Shaft Center Bearing—
41-42-46-47-4840 Series

The center bearing consists of two Durex oil-absorbing bushings housed in a metal retainer. The retainer is jacketed to provide an oil reservoir. This bearing requires lubrication with engine oil every 5,000 miles and is oiled manually through the hole in the top side after removing the locating screw. The locating screw should be lock-wired in place.

> CAUTION: *Do not turn the shaft or rear wheel while the locating screw is removed as the bearing would move out of center.*

The center bearing is located by the above mentioned screw and is held in place by clamp brackets and bolts. During assembly the center bearing is clamped after both ends of the torque tube have been secured. This permits the center bearing to align itself.

Torque Tube Trunnion Bracket—
41-42-46-47-4840 Series

The front end of the torque tube has a coarse pitch thread on which the trunnion bracket operates.

The trunnion bracket is slotted on the underside and provided with an adjustable clamp screw with slotted nut and cotter pin so that the clamp screw may be adjusted to remove excess clearance between the trunnion bracket thread and the thread of the torque tube. This clamp screw should be drawn up sufficiently to remove excess clearance without setting up excessive friction as the trunnion bracket must be free to move on the threaded tube.

The rear end of the trunnion bracket is also provided with a rubber boot to protect the threaded tube against road dirt. No lubrication is required at this point except at the time of assembly when the threaded parts should be sparingly lubricated.

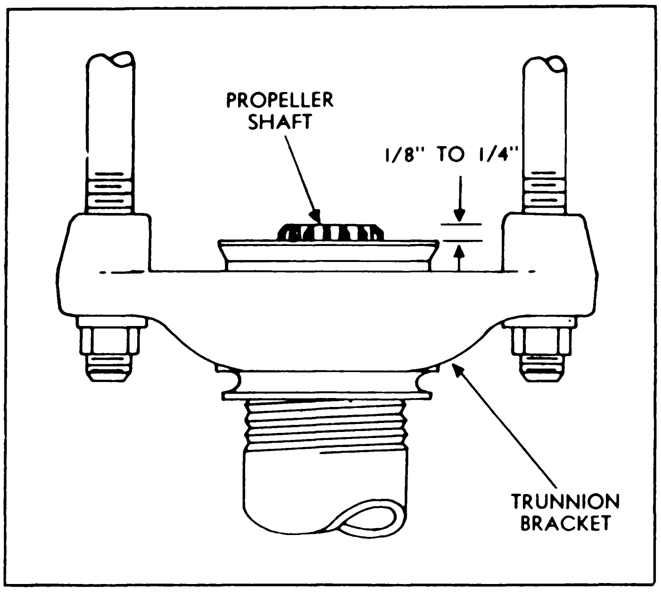


Figure 44—Propeller Shaft Projection.

In assembly, when the rear end of the propeller shaft is against the pinion shaft and the torque tube secured to the rear axle housing, the front end of the propeller shaft should project from ⅛ to ¼" beyond the front face of the trunnion bracket. A projection of less than ⅛" may cause contact between the universal joint slinger and the bracket. More than ¼" clearance will make the slinger ineffective. (See Fig. 44.)

Truss Rods

In assembling the torque tube to rear axle truss rods, both rods should be drawn up in a uniform manner at the front bracket and locked securely in place so that the torque tube is in proper alignment with the rear axle.

Trunnion Bracket to Overdrive or Transmission Adapter

Two special studs are used to attach the trunnion bracket to the transmission or overdrive rear bearing bracket. These studs have a tapered section fitting into the trunnion bracket and are locked in place by a nut and lock-washer. Rubber cushion blocks with pilot ends are installed on the front and rear sides of the transmission or overdrive rear bearing cap. (See Fig. 43.)

Note that two of the stamped steel retainers have pilot flanges and that the other two are plain. The two retainers with pilot flanges are installed with rubber blocks having pilot ends on either side of the transmission or overdrive bearing bracket. The plain retainers go on the outside with the rubber cushion blocks between the two retainers.

Retainer nuts at the front end of the studs should be drawn down to a point where the rubber cushion blocks are held under a slight tension and locked in place with the stamped steel "Pal" nuts. It is not necessary to disturb the nut and lockwasher at the rear end of the studs.

Universal Joint—41-42-47-4840 Series

One joint is used between the front end of the propeller shaft and the transmission drive or overdrive tail shaft. A tapered coil spring backed by a welded plug is assembled into the front end of the universal joint. The spring assures correct location of the joint on the drive shaft.

A stamped steel slinger is a pressed fit on the rear yoke and prevents sand or road dirt from entering the torque tube at this point.

Care must be used when making this assembly to prevent interference between the slinger and the front side of the trunnion bracket with which the slinger operates.

Occasional inspection, of universal joints for looseness and repact, every 15,000 miles is suggested.

Universal Joint Disassembly—41-42-46-47-4840 Series

The front end having the coil spring is a slip fit on the transmission end and a slight press fit on the propeller shaft.

The four end bearings, or roller retainers, are identical in this type of joint and are held in yoke ends by snap rings, as shown in Fig. 45. On the four trunnions of the cross are cork seal retainers. In dismantling or reassembling the universal joints, use care not to dent or disturb these retainers.

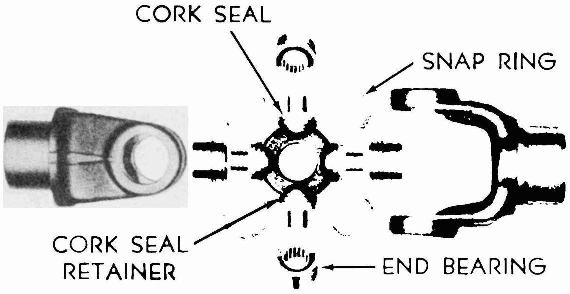


Figure 45—41-42-46-47-4840 Series Universal Joint Parts.

Universal Joint Parts— 41-42-46-47-4840 Series

The snap rings, as shown in Fig. 45, are removed by securing the joint in a vise and using a hammer and punch.

After the snap rings have been removed, the assembly should be placed on parallels or in a vise, as shown in Fig. 46, with the trunnions of the cross resting on the parallels or vise jaws. By striking the suspended yoke with a babbit hammer, as shown, the yoke member will be driven down to a point where it contacts the cross. This will leave the end bearing protruding, as shown in Fig. 45.

Turn the assembly over and repeat the operation so that both end bearings are projecting beyond the ends of the yoke.

Carefully clamp the projecting end bearing in a vise, and then strike the yoke member with a babbit hammer until the bearing is completely released. The end bearings should be a slightly tight press fit in the yoke. Repeat this operation on the other end bearing.

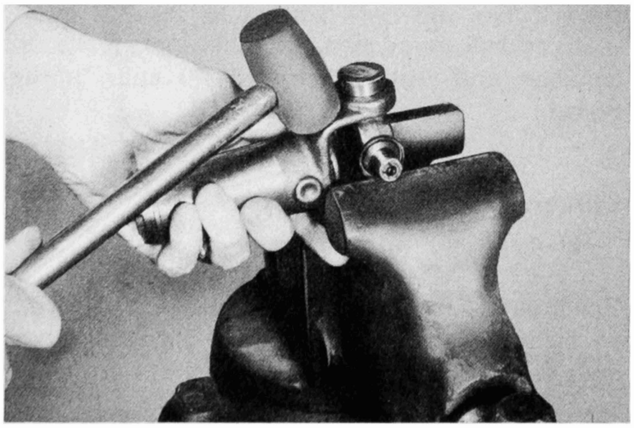


Figure 46—Remove End Bearing from Yoke.

Carefully inspect all parts and if the trunnions of the cross show signs of wear, the complete cross assembly—which includes corks, snap rings, and cork retainers—should be replaced.

If only the end bearings require replacement these are furnished in pairs including snap rings, and cork seal washers. Use extreme care at all times to prevent the entrance of dirt and make sure that there is sufficient lubricant in the bearings before assembly. Any good high grade semi-fluid lubricant is satisfactory.

Universal Joint Assembly— 41-4260-80, 46-47-4860 Series

Install cross in yoke and partially assemble end bearings with NEW CORK SEAL WASHERS in place. Rest one of the end bearings on a flat plate, as shown in Fig. 47, and with a soft hammer drive on the other end bearing.

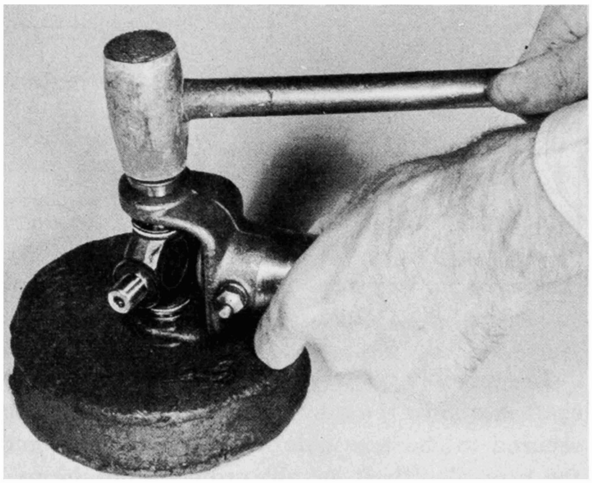


Figure 47—Assembling End Bearing to Yoke.

When both end bearings are approximately flush with the outside of yoke, the snap rings are to be installed.

Always use NEW SNAP RINGS and make sure that they are securely seated in the grooves of the end bearings. After both snap rings are in place support the cross in a vise, as shown in Fig. 46, and tap yoke lightly with a soft hammer so that the snap rings are seated against the inside surface of the yoke.

Universal Joints and Bearing Construction— 41-4260-80, 46-47-4860 Series

The two end bearings in the yoke end are retained by snap rings while the two end bearings at the companion flange end are loose. It is, therefore, necessary to wire the loose end bearings in place when a propeller shaft or universal shaft is removed.

Propeller Shaft Coupling

Starting with Serial Number N4-101886—46-4740 Series—the propeller shaft coupling was changed in production. The new coupling has a shorter threaded section which leaves more material in the area where the pinion and propeller shafts butt. This new coupling can be identified in the following manner: The threaded section of the old coupling was 1¼″; in the new coupling the threaded section is only ⅞″ long.

Evidence of coupling failure in cars before the above serial number indicates that the coupling nut was not tightened properly.

CAUTION: *When installing the propeller shaft to the pinion shaft, support the propeller shaft for its full length in line with the pinion shaft. This is to prevent a binding action on the coupling as the coupling nut is tightened.*

Propeller Shaft Inspection

Whenever a propeller shaft is removed from a car it should be inspected; or if the propeller shaft sets up a high speed vibration in operation it should be inspected for alignment. A bent propeller shaft should be replaced.

Before removing a propeller shaft for high speed vibration first inspect all of the wheels and tires for an unbalanced condition. In the 60 and 80 series high speed propeller shaft vibration should not be confused with a vibration that can be set up by the incorrect angle of the pinion shaft.

Always inspect the propeller shaft splines for scoring. Any scoring will indicate misalignment of the drive line. Inspect the companion flanges for burrs which may be the cause of the misalignment.

60 Series

All propeller shafts in service include both front and rear universal joints, which are balanced as an assembly at the factory. These units are available under the following descriptions:

Part Number	Description
91762	Propeller Shaft (with Overdrive used on cars before Serial No. N6-120026)
3106384	Propeller Shaft (without Overdrive 46-47-4860)
3121373	Propeller Shaft (with Overdrive starting with Serial No. N6-120026 —4660 and all 47-4860 Series)

REAR AXLE SPECIFICATIONS

Year Series	4140	4240	4640	4740	4840
Type	Semi-Floating	Semi-Floating	Semi-Floating	Semi-Floating	Semi-Floating
Drive Gear Type	Hypoid	Hypoid	Hypoid	Hypoid	Hypoid
Ring Gear and Pinion Back-lash	.004″ to .006″	.004″ to .006″	.004″ to .006″	.004″ to .006″	.004″ to .006″
Axle Shaft End-play	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″
Axle Shaft End-play Adjustment	Shims	Shims	Shims	Shims	Shims
Pinion Shaft Bearing Tension	12″ lbs. to 14″ lbs.	12″ lbs. to 14″ lbs.	12″ lbs. to 14″ lbs.	12″ lbs. to 14″ lbs.	12″ lbs. to 14″ lbs.
Pinion Bearing Adjustment	Shims	Shims	Shims	Shims	Shims
Differential Side Bearing Tension	.005″	.005″	.005″	.005″	.005″
Differential Side Bearing Adjustment	Shims	Shims	Shims	Shims	Shims
Lubrication Capacity	3 Pts.	3 Pts.	3 Pts.	3 Pts.	3 Pts.
Type of Lubrication	S.A.E. 90 Hypoid	S.A.E. 90 Hypoid	S.A.E. 90 Hypoid	S.A.E. 90 Hypoid	S.A.E. 90 Hypoid
Rear Axle Ratio (Standard)	4.1-1	4.1-1	4.1-1	4.1-1	4.4-1
Rear Axle Ratio (Optional)	4.4-1	4.4-1	4.4-1	4.4-1	4.9-1
Rear Axle Ratio (with Overdrive)	4.4-1	4.4-1			4.9-1
Year Series	**4160 4180**	**4260 4280**	**4660**	**4760**	**4860**
Type	Semi-Floating	Semi-Floating	Semi-Floating	Semi-Floating	Semi-Floating
Drive Gear Type	Hypoid	Hypoid	Hypoid	Hypoid	Hypoid
Ring Gear and Pinion Back-lash	.004″ to .006″	.004″ to .006″	.004″ to .006″	.004″ to .006″	.004″ to .006″
Axle Shaft End-play	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″	.002″ to .004″
Axle Shaft End-play Adjustment	Shims	Shims	Shims	Shims	Shims
Pinion Shaft Bearing Tension	15″ lbs. to 18″ lbs.	15″ lbs. to 18″ lbs.	15″ lbs. to 18″ lbs.	15″ lbs. to 18″ lbs.	15″ lbs. to 18″ lbs.
Pinion Bearing Adjustment	Shims	Shims	Shims	Shims	Shims
Differential Side Bearing Tension	.004″ to .006″	.004″ to .006″	.004″ to .006″	.004″ to .006″	.004″ to .006″
Differential Side Bearing Adjustment	Adj. Nut	Adj. Nut	Adj. Nut	Adj. Nut	Adj. Nut
Lubrication Capacity	4 Pts.	4 Pts.	4 Pts.	4 Pts.	4 Pts.
Type of Lubrication	S.A.E. 90 Hypoid	S.A.E. 90 Hypoid	S.A.E. 90 Hypoid	S.A.E. 90 Hypoid	S.A.E. 90 Hypoid
Rear Axle Ratio (Standard)	4.1-1	4.1-1	4.1-1	4.1-1	4.1-1
Rear Axle Ratio (with Overdrive)	4.4-1	4.4-1	4.4-1	4.4-1	4.4-1

FRONT AXLE-
FRONT SUSPENSION-
STEERING GEAR SECTION

Nash

TECHNICAL MANUAL

41-4240 SERIES FRONT SUSPENSION DESCRIPTION 2

SERVICING FRONT SUSPENSION 41-4240 SERIES 4

WHEEL ALIGNMENT FACTORS 4

SERVICE PROCEDURE 41-4240 SERIES 5

ASSEMBLY 6

INSTALLATION IN THE CAR 41-4240 SERIES 7

LUBRICATION FRONT SUSPENSION 41-4240 SERIES 8

41-4260-80, 46-47-4840-60 SERIES FRONT SUSPENSION DESCRIPTION 8

UPPER AND LOWER CONTROL ARMS 9

FRONT COIL SPRINGS 10

WHEEL AND TIRE BALANCE ALL SERIES 12

SHOCK ABSORBERS ALL SERIES 12

LUBRICATION FRONT SUSPENSION 41-4260-80, 46-47-4840-60 SERIES 12

41-4260-80, 46-47-4840-60 SERIES STEERING GEARS 12

41-4240 SERIES STEERING GEARS 14

SPECIFICATIONS 16 and 17

FRONT AXLE—FRONT SUSPENSION— STEERING GEAR SECTION

NASH TECHNICAL MANUAL

FRONT AXLE—FRONT SUSPENSION

41-4240 Series, Description

The principle involved in this type of front suspension permits the steering knuckle to move up and down on the steering knuckle pin. This design is adaptable to the type of body construction used in the 41-4240 Series.

The bottom of this steering knuckle pin is rigidly fastened to the body by the front axle channel. At the top it is connected to the camber and caster adjusting rods which in turn are connected to the body by brackets.

The steering knuckle rolls up and down on hardened rollers shaped like an hour glass. The steering knuckle is made in two parts. One, a forging, supporting the brake support plate and the front wheel spindle; the other, a hardened tube which forms the outer race for the roller bearings, which is tapered to permit installation of the tube in the steering knuckle.

Surrounding the knuckle pin outer bearing is the coil spring which is covered by a rubber boot to prevent dirt from entering the knuckle pin bearings and other parts.

Paralleling the action of the coil spring is a hydraulic shock absorber. When the steering knuckle travels to the extreme ends of the pin, it stops against the rubber cushions. The upper cushion is inside the spring while the lower one can be seen mounted on the front axle channel. See Fig. 1.

This lower cushion supports the steering knuckle whenever the car is jacked up. The steering wheel, therefore, should not be turned excessively, when the front wheels are lifted clear of the floor.

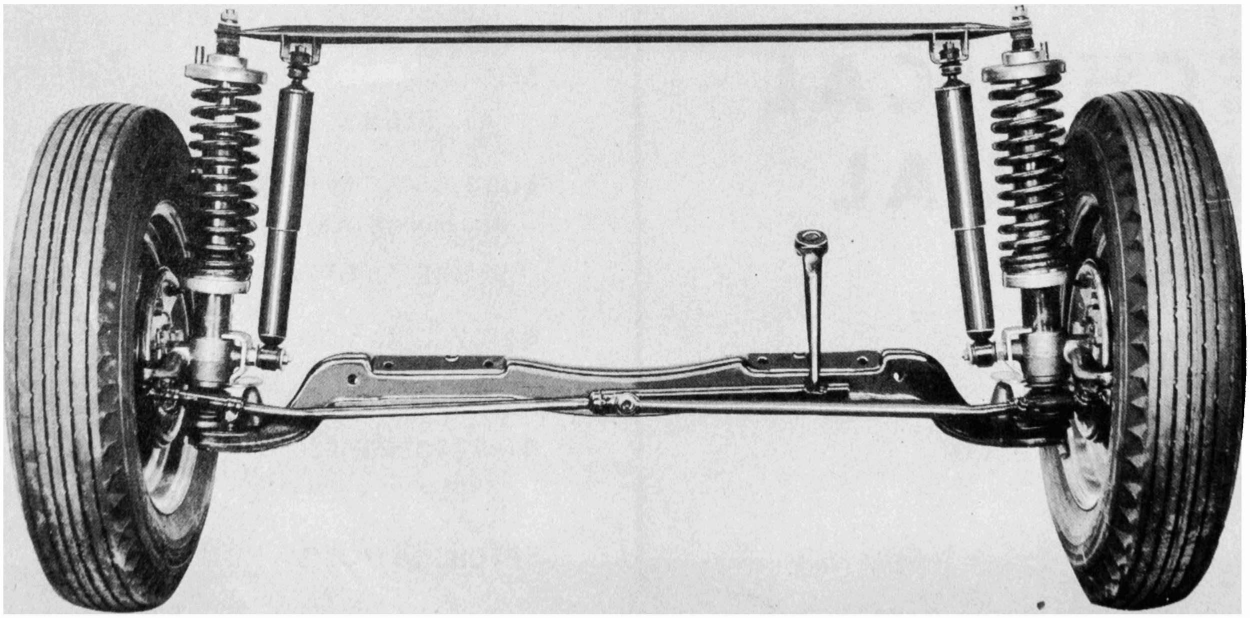


Figure 1—41-4240 Front Suspension.

DESCRIPTION

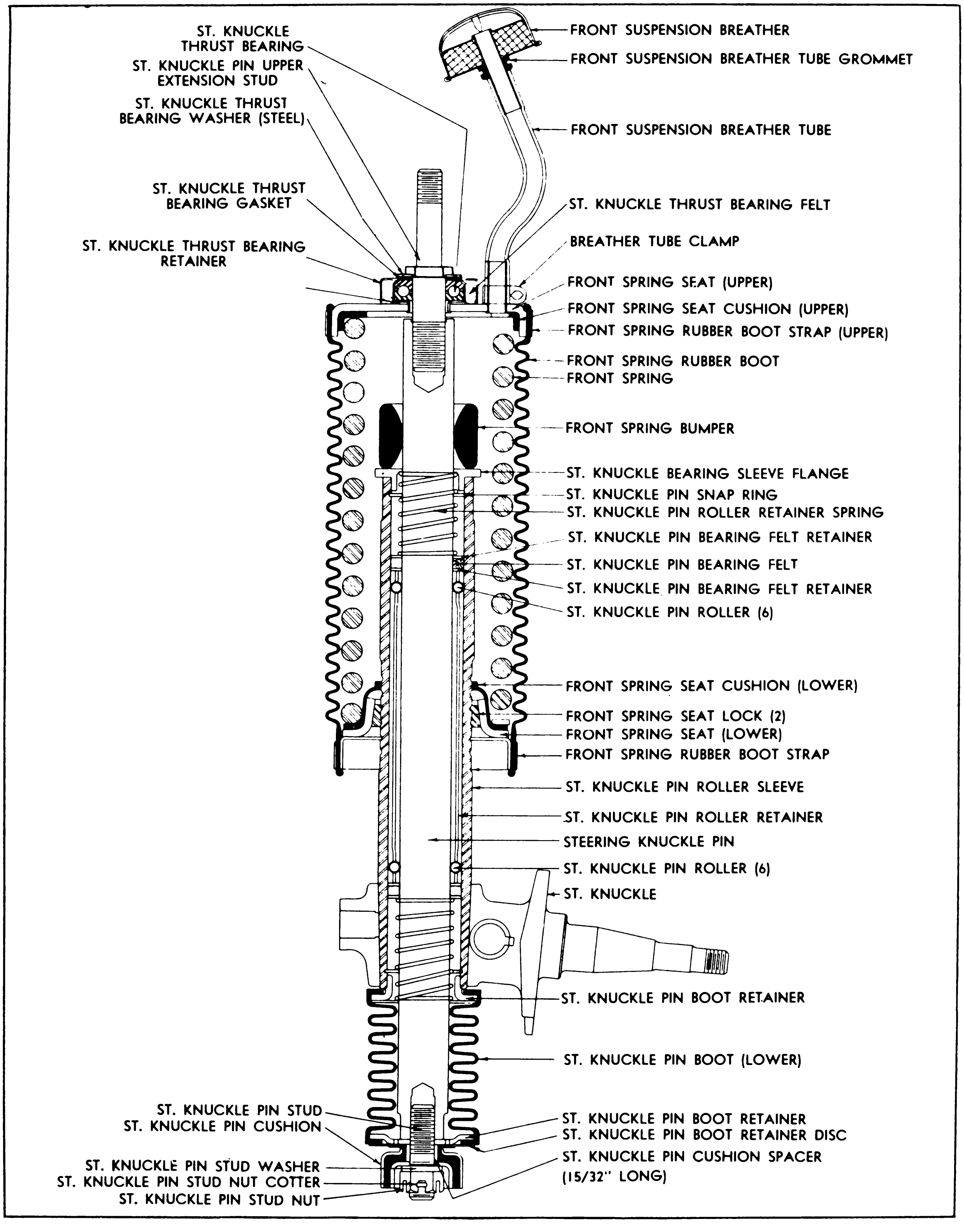

ST. KNUCKLE THRUST BEARING
ST. KNUCKLE PIN UPPER EXTENSION STUD
ST. KNUCKLE THRUST BEARING WASHER (STEEL)
ST. KNUCKLE THRUST BEARING GASKET
ST. KNUCKLE THRUST BEARING RETAINER
FRONT SUSPENSION BREATHER
FRONT SUSPENSION BREATHER TUBE GROMMET
FRONT SUSPENSION BREATHER TUBE
ST. KNUCKLE THRUST BEARING FELT
BREATHER TUBE CLAMP
FRONT SPRING SEAT (UPPER)
FRONT SPRING SEAT CUSHION (UPPER)
FRONT SPRING RUBBER BOOT STRAP (UPPER)
FRONT SPRING RUBBER BOOT
FRONT SPRING
FRONT SPRING BUMPER
ST. KNUCKLE BEARING SLEEVE FLANGE
ST. KNUCKLE PIN SNAP RING
ST. KNUCKLE PIN ROLLER RETAINER SPRING
ST. KNUCKLE PIN BEARING FELT RETAINER
ST. KNUCKLE PIN BEARING FELT
ST. KNUCKLE PIN BEARING FELT RETAINER
ST. KNUCKLE PIN ROLLER (6)
FRONT SPRING SEAT CUSHION (LOWER)
FRONT SPRING SEAT LOCK (2)
FRONT SPRING SEAT (LOWER)
FRONT SPRING RUBBER BOOT STRAP
ST. KNUCKLE PIN ROLLER SLEEVE
ST. KNUCKLE PIN ROLLER RETAINER
STEERING KNUCKLE PIN
ST. KNUCKLE PIN ROLLER (6)
ST. KNUCKLE
ST. KNUCKLE PIN BOOT RETAINER
ST. KNUCKLE PIN BOOT (LOWER)
ST. KNUCKLE PIN STUD
ST. KNUCKLE PIN CUSHION
ST. KNUCKLE PIN STUD WASHER
ST. KNUCKLE PIN STUD NUT COTTER
ST. KNUCKLE PIN STUD NUT
ST. KNUCKLE PIN BOOT RETAINER
ST. KNUCKLE PIN BOOT RETAINER DISC
ST. KNUCKLE PIN CUSHION SPACER (15/32" LONG)

Figure 2—Cross-section Front Suspension Unit, 41-4240 Series.

The steering knuckle turns in the conventional manner about the knuckle pin. During this motion, the rollers have a sliding action.

Ventilation

This assembly is vented at the top of the spring through a tube connected with an air cleaner (Fig. 2).

It is vitally important that both the upper and lower rubber boots be inspected seasonally for fractures which would admit dirt to the interior of the assembly and shorten the life of the roller bearings.

The purpose of the air cleaner is to prevent water and dirt accumulating inside the unit.

Servicing Front Suspension— 41-4240 Series

Incorrect alignment of front wheels will result in hard steering and abnormal tire wear. Front wheel alignment is the correct relationship of all parts of the chassis which affect the parallel tracking of the wheels regardless of the direction in which the car is moving.

WHEEL ALIGNMENT FACTORS

1. Caster

Caster is the amount in degrees that the top of the kingpin is tilted backward or forward from the front of the car. It is important that caster be the same on both front wheels. It is also important that caster be checked and adjusted before making succeeding readings because caster adjustments have an effect on both camber and toe-in.

41-4240 Series

This type of front suspension uses diagonal tie rods to adjust caster and camber (Fig. 3). To decrease caster, shorten the front rods and lengthen the rear rods. When the adjustment is complete, always be sure that all nuts and lock nuts have been tightened securely.

2. Camber

Camber is the amount in degrees that the top of the wheels is out or away from the center of the car. It is important that camber be the same on both wheels.

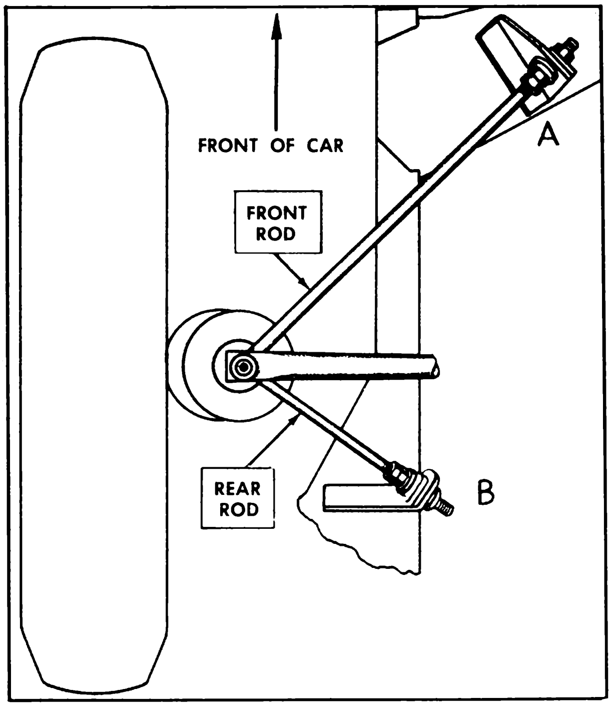


Figure 3—Diagonal Tie Rods Control Caster and Camber Adjustments on the 41-4240 Series.

41-4240 Series

One important factor must be borne in mind when adjusting camber on this type of front suspension: The steering knuckle pin tie rod holds the tops of the two knuckle pins in a rigid relationship so that any change in camber on one front wheel will automatically change the other front wheel. (Fig. 3.) Thus if you increase camber in the left front wheel, you will automatically decrease camber in the right front wheel. You will also realize that the only camber adjustment that can be made is to make camber equal on both front wheels. To do this shorten both the front and rear rods on the side with too much camber, and lengthen both rods on the side with too little camber. In doing this remember that 1½ turns of the adjusting nuts "A" and "B" will change camber approximately ¼ degree.

CAUTION: *Be sure that all nuts and lock nuts are tightened after adjustments have been made.*

3. Kingpin Angle

Kingpin angle is the amount in degrees that the top of the kingpin is tilted in at the top toward the center of the car. The purpose of kingpin angle is to assist in the ease of steering.

41-4240 Series

In this type of front suspension the kingpin angle and camber angle are closely related. Equalizing camber between the two front wheels also equalizes the kingpin angles between the two wheels. Separate adjustments cannot be made.

4. Toe-In

Toe-in is the amount in inches that the front of the front wheels are closer together than the rear of the front wheels.

4140-60, 4240 Series

The steering linkage on this series consists of two tie rods connected together. One is connected to the steering ball arm. (Fig. 14.) To correct toe-in on this series, place the steering gear in the mid-position, loosen the clamp at the outer end of each tie rod, and turn each tube separately until both wheels are perfectly straight ahead. Then lengthen each tie rod the same amount until toe-in is correct according to the specifications on page 16. Be sure to tighten all clamp screws when adjustment has been made.

5. Toe-Out

Toe-out is the ability of the front wheels of a car to turn and maintain parallel relationship with the other wheels while in a turn.

This relationship is fixed—it cannot be adjusted. To check it, simply measure from the brake backing plate to the center of the steering arm ball. Check this distance against the specifications on page 16. If it is not within the specifications the arm has been bent and should be replaced.

Preliminary Checking of Front Wheel Alignment

Some preliminary checks are advisable before any attempt is made to adjust the caster, camber and toe-in, these are as follows:

1. Inflate all tires to the correct pressure.
2. Inspect the frame for alignment.
3. Inspect the springs for sagging.
4. Inspect spring shackles.
5. Inspect for loose "U" bolts.
6. Inspect the rear axle for alignment.
7. Inspect the tie rod and ball joints for looseness.
8. Inspect the steering gear for looseness.
9. Inspect front wheel bearings for looseness.
10. Inspect the upper and lower control arms.
11. Inspect the kingpin bushings for looseness.
12. Inspect the brake drum for out of round.
13. Inspect the shock absorbers and stabilizers.
14. Inspect wheel run-out and wheel balance.

Coil Spring Identification—41-4240 Series

The front springs are the same on all models; each spring can be raised to compensate for variation in length as described below.

The front spring seat locks are installed at the factory in the third and fourth grooves from the top. When it is desired to raise the spring ⅜", the locks are removed and installed one step or in extreme cases two steps, above the original position.

SERVICE PROCEDURE—41-4240 SERIES

Removal of Unit

Raise the front end of the car, supporting it securely. Remove the wheel and hub as an assembly. Remove the four screws which hold the brake support plate. DO NOT DISCONNECT THE HYDRAULIC BRAKE LINE, leave it attached to the support plate and hang it up under the fender out of the way.

Remove the rubber boot straps and lower the boot to permit installation of the spring clamps (Tool J-1608); then compress the spring. This will permit the removal of the nuts at the upper and lower ends of the knuckle pin studs. (See Fig. 4.)

Disconnect the tie rod at the steering arm and the shock absorber at the lower end. Remove the breather cap and loosen the tie-rod cover from the fender apron.

Remove the nuts and washers from the ends of the caster and camber rods. Raise the cross tie-rod from the knuckle pin extension stud and remove both caster and camber rods.

Remove the assembly as a complete unit.

NOTE: *Some mechanics prefer to raise the assembly sufficiently for the lower stud to clear the axle without removing the caster, camber rods from the car. However, in any case, caution must be taken to retain the knuckle pin in the suspension assembly while removing it.*

Disassembly

Remove the lower boot and mount the unit in a vise, holding the flat portion at the lower end of the knuckle pin. Remove the upper knuckle pin extension stud together with the thrust bearing and upper spring seat assembly. (See Figs. 2 and 4.)

The coil spring can now be removed followed by the knuckle pin cork seal and retainer, rubber rebound bumper, rubber boot, lower spring seat and seat locks. (See Fig. 5.)

Install the sleeve in the vise, remove the lower flange, and drive off the steering knuckle.

All component parts of the assembly must be thoroughly cleaned and inspected before assembly.

Assembly

The steering knuckle pin and sleeve assembly will be supplied for service as an assembly, consisting of knuckle pin, 12 rollers, felt seals, retainers, springs, snap rings and flanges. This assembly is completely lubricated during assembly and is not to be disassembled before installing, with the exception of removing the lower flange (boot retainer) to permit installation of the steering knuckle.

Mount the sleeve in a vise, remove the lower flange, and install the steering knuckle. Assemble the lower boot to the flange using rubber cement or similar sealing compound, and install it in the sleeve.

Mount the knuckle pin in a vise and install the spring seat locks to register with the lower grooves, as shown in Fig. 6, holding them in position with masking tape to prevent the locks from being dislocated during subsequent assembly operations.

Install the lower spring seat, seat cushion, rubber boot, boot clamps and the rebound bumper. (See Fig. 5.)

Install the coil spring with clamps in place.

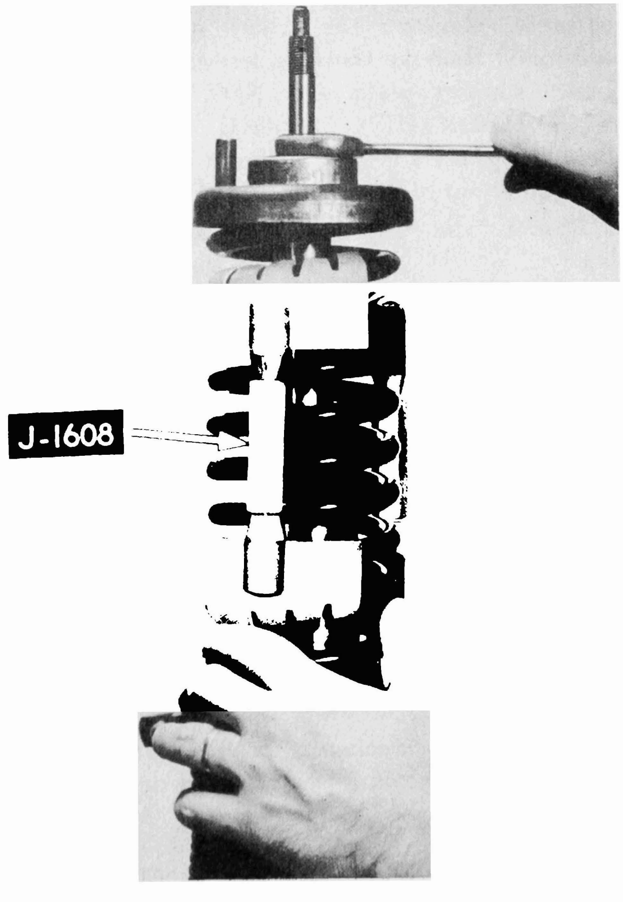


Figure 4—Removing Stud, Thrust Bearing and Spring Seat Assembly, 41-4240 Series.

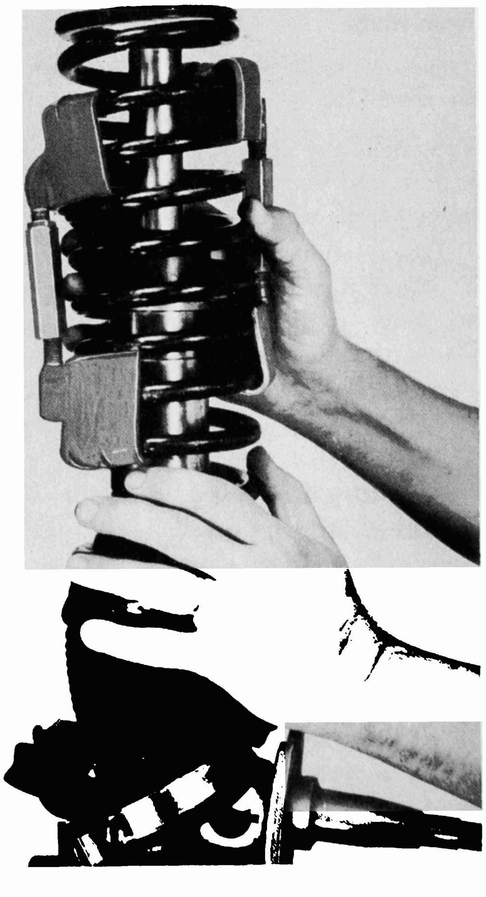


Figure 5—Removing Coil Spring, Corkseal, Rubber Bumper, Boots, and Lower Spring Seat, 41-4240 Series.

Install a new cork seal and retainer to the upper end of the knuckle pin.

Complete the upper assembly by installing the upper spring seat and thrust bearing assembly, which is held in place by the knuckle pin upper extension stud. (See Fig. 7.)

NOTE: *The notch in the spring seat cushion must be in line with the breather tube on the spring seat.* (Fig. 7.)

A new Neoprene seal must be used to seal the knuckle pin extension to the spring seat.

The breather tube must point toward the outside and in line with the steering knuckle spindle.

Complete the final assembly by installing the lower knuckle pin boot retainer disc with the concave side up, again using a sealing compound between the boot and retainer. Install boot clamps and insulated washer with the rubberized side down.

As a precautionary measure, it is advisable to install temporarily the lower bushing, spacer and nut to the lower stud to prevent the knuckle pin from being displaced. (See Fig. 2.)

NOTE: *Do not remove the lower stud from the assembly at any time. To do so would damage the Neoprene seal between the stud and pin.*

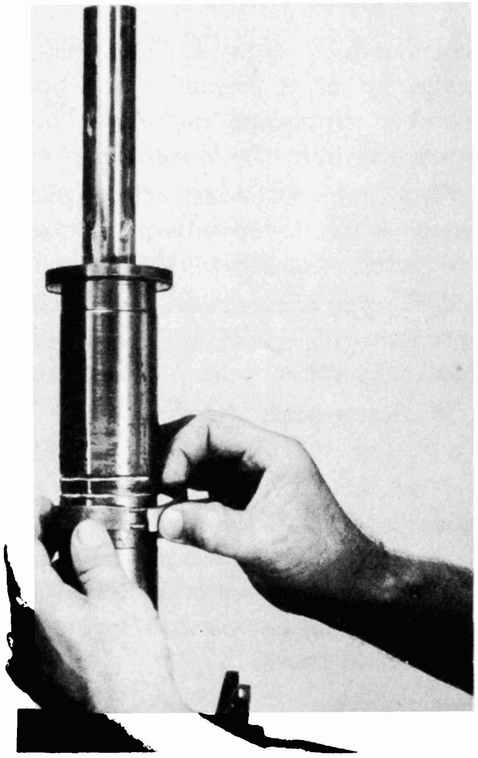


Figure 6—Spring Seat Lock Register with Lower Grooves, 41-4240 Series.

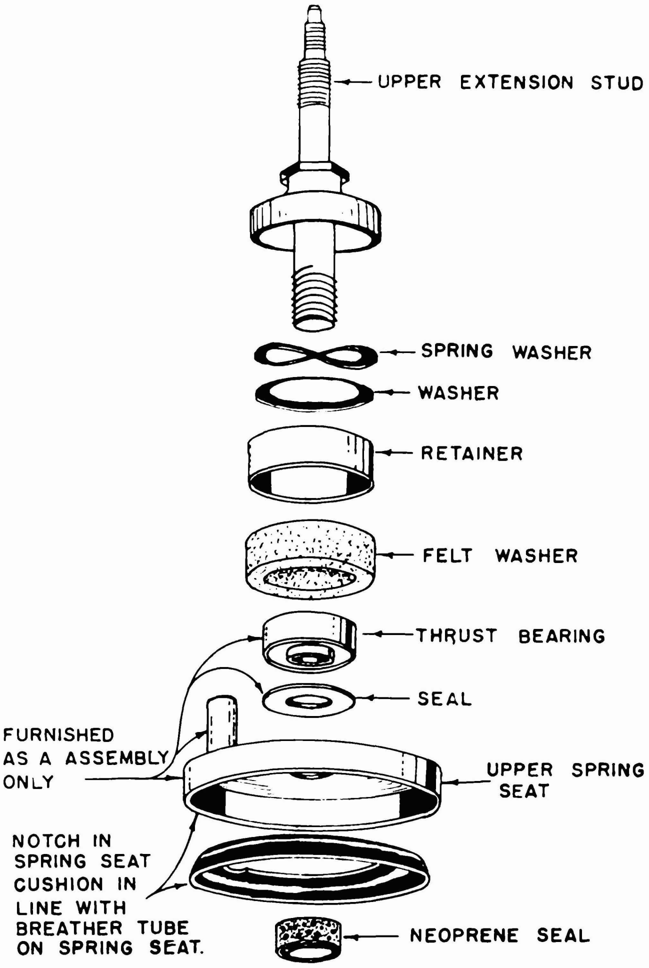
Installation

Install the front suspension unit on the front axle, with the rubberized surface of the insulating washer against the axle.

If the axle is of the reinforced type with a reinforcing washer spot welded on the lower side, install the spacer, cushion, plain washer and nut in sequence. However, do not tighten the nut at this time, to permit installation of caster and camber rods.

If the axle is not of the reinforced type it will be necessary to install a 3/32" thick flat washer between the cushion and the axle.

Install the short caster and camber rods in the cowl bracket and over the knuckle pin extension with the chamfered side down. Install the long rod, cross tie-rod, lock washer and nut and draw up tightly.



UPPER EXTENSION STUD
SPRING WASHER
WASHER
RETAINER
FELT WASHER
THRUST BEARING
SEAL
FURNISHED AS A ASSEMBLY ONLY
UPPER SPRING SEAT
NOTCH IN SPRING SEAT CUSHION IN LINE WITH BREATHER TUBE ON SPRING SEAT.
NEOPRENE SEAL

Figure 7—Front Suspension Upper Assembly, 41-4240 Series.

CAUTION: *Make sure the lower cushion is properly placed in the axle mounting hole. Tighten the nut and install a cotter pin.*

Remove the spring clamps. Use sealing compound between the upper boot and coil spring seats. Tighten the boot clamps.

Reassemble the shock absorber to its fulcrum. Connect the steering tie-rod to the steering arm. Install a cotter pin.

Connect the bearing oiler tube through the opening in the fender apron to the upper extension, placing a felt washer over the end of the tube. Install the breather cap.

NOTE: *On some early models it may be necessary to drill through the fender apron to install the bearing oiler tube. If so, locate a line passing through the center of the top stud of the tie-rod cover and the breather hole in the fender apron. Measure from the center of the breather hole along the line toward the stud 1-13/16" and drill a locating hole, then drill up from under the fender using an 11/16" drill.* (See Fig. 8.)

Install the brake support plate and tighten the four screws securely. Then install the hub and wheel assembly and replace the hub cap.

Lower the car and set the caster, camber and toe-in in accordance with factory specifications as shown on page 16.

Lubrication of Front Suspension— 41-4240 Series

The knuckle pin rollers are held in a retainer which have felt seals in both top and bottom. These seals in turn are held in position with a light spring. (See Fig. 2.)

The lubricant is packed in the roller bearings during assembly and is confined in the retainer by the felt seals. The lubricant will protect the roller bearings as long as dirt is prevented from entering the roller retainer assembly.

The steering knuckle thrust bearing is of the conventional ball thrust type and requires pressure lubrication at 5000-mile intervals.

FRONT AXLE—FRONT SUSPENSION

The 41-4260-80, 46-47-4840-60 Series—Description

This is a conventional type of front suspension. It is a completely independent front sub-assembly, which reduces front end unsprung weight, and is made up of a pressed steel, box section, cross member supporting the upper and lower control arms that form the wheel suspension.

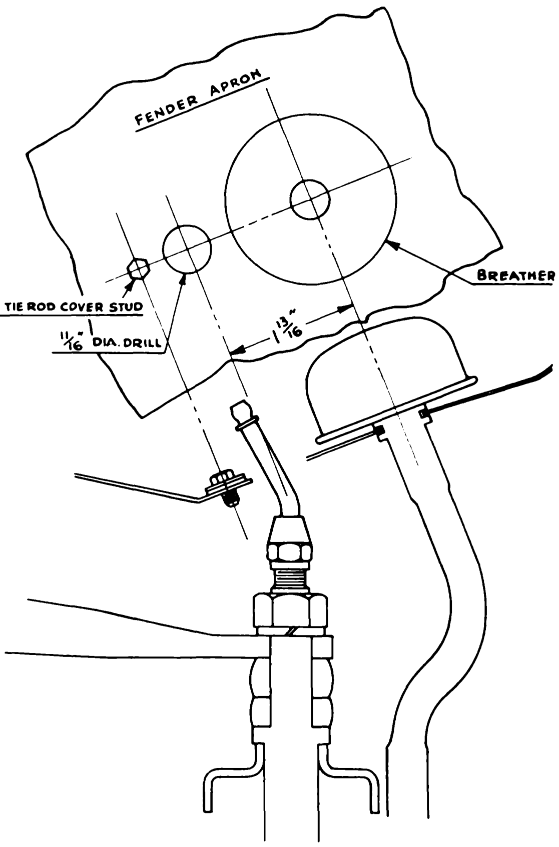


Figure 8—Correct Installation of the Breather Unit, 41-4240 Series.

This type of construction allows each front wheel to act independently of the other, thereby producing a smoother ride.

This type of front end suspension employs a coil spring at each wheel, eliminating steering problems caused by other types of spring suspension.

A direct acting shock absorber is located in the vertical center of the spring, as shown in **Fig. 9.**

The control arms permit the knuckle support, wheel and spindle to move through a vertical plane as the car moves over the road, thus maintaining the correct relation of camber for the variation of tread width as the coil springs are compressed under road shock.

41-4260-80, 46-47-4860 Series

A ride stabilizer bar is provided to control body roll. This bar is mounted in rubber over the front

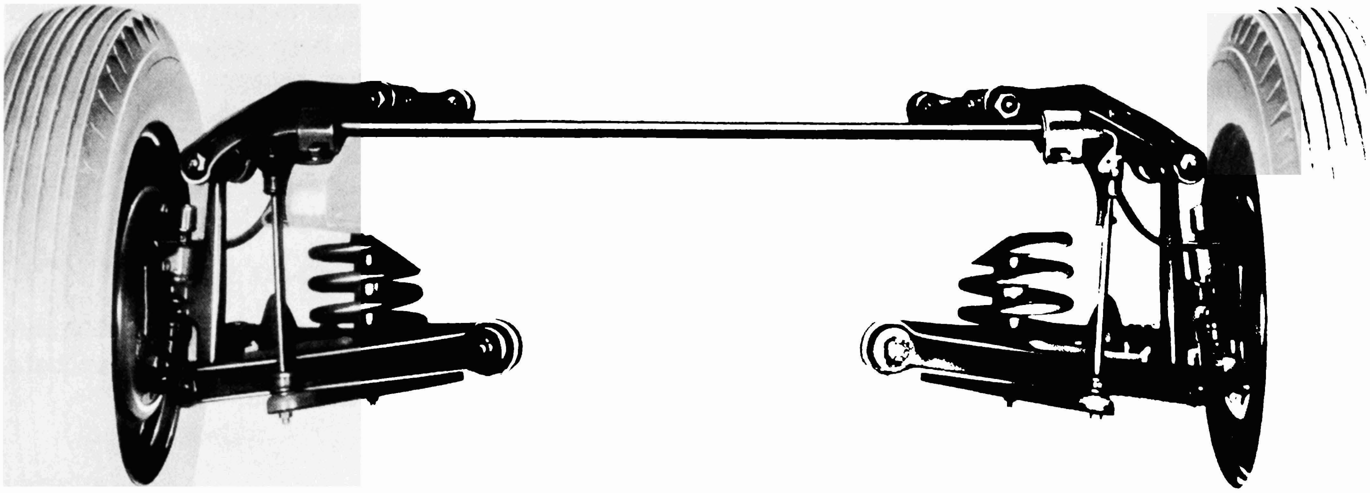


Figure 9—41-4260-80, 46-47-4840-60 Series Front Wheel Suspension.

frame ends ahead of the springs. It is connected by links to the lower control arms, reacting to up and down movement of the wheels.

41-42-46-47-4840 Series

The stabilizer or alignment bar is at the rear, connected to the body on the right side and to the rear axle housing on the left side. Its function is to maintain vertical alignment between the rear axle and the body, irrespective of the spring movements.

Upper and Lower Control Arms

The upper control arm is provided with threaded bushings at each end, the inner end pivoting on a pivot shaft which is adjustable for caster and camber. The steering knuckle support, as shown in Fig. 9, is attached to the upper control arm at the outer end by a threaded bolt and bushing.

41-4260-80 Series

The lower control arm pivots at the inner end on rubber bushings. These bushings should not be lubricated, as the pivoting motion at these points is absorbed by the resiliency of the rubber. The bushings are adjusted to a definite tension by drawing up the nuts as tight as possible, the tension on the rubbers being limited by a shoulder on the pivot shaft.

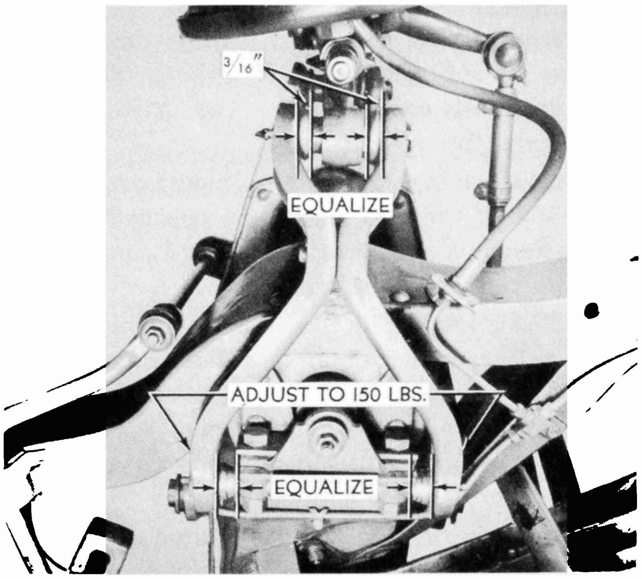


Figure 10 — 41-4260-80, 46-47-4840-60 Series Equalize Upper and Lower Control Arm.

These rubber bushings should not require replacement in the normal life of the car. If they are damaged through lubricating with mineral oil, they may be replaced by cutting out the old bushings and pressing in the new ones well lubricated with castor oil or brake fluid.

46-47-4840-60 Series

The upper and lower control arms now have threaded bushings at the inner ends. These bushings do require lubrication. Lubrication fittings are provided at each bushing and should be lubricated with chassis lubricant every 1,000 miles.

The present lower control arm used on the 60 series, with the threaded bushings, can be used on the 41-4260-80 series. These lower control arms are supplied for service.

The lower end of the steering knuckle support pivots at the outer end of the lower control arm on a bolt and threaded bushing as shown in Fig. 10.

The threaded bushing and bolt at the outer ends of the upper and lower control arms are provided with rubber seals to retain lubricant and prevent the entrance of dirt. In making this assembly, as well as the threaded bushings at the inner end of the upper control arm, the clearances, as shown in Fig. 10, must be equalized. All threaded bushings are drawn up to a tension of 150 foot pounds in order that the bushings will be locked and held in place by the external threads.

FRONT COIL SPRINGS

41-4260-80, 46-47-4840-60 Series

These front coil springs must always be used in pairs on an individual car. They are not interchangeable between series as the spring height varies. Refer to pages 16, 17.

When inspecting springs it is important that the free height of the coil springs be checked as well as the height under load. A sagged spring will affect the camber of the car.

The 4180 and 4280 Series springs, when new, are identified with a daub of yellow paint across the two center coils. This will wear off in service, so checking the free height to the approximate dimensions will usually suffice in identifying these springs. Refer to specifications on pages 16, 17.

Where additional height is required to prevent the springs from "bottoming" or "riding through" in rough territories 1/4" thick spacers are supplied and may be used to increase the riding height. One of these spacers installed between the lower end of the coil spring and the seat insulator will increase the riding height by slightly more than 1/2", due to the leverage of the front suspension control arms. In extreme cases where it is necessary to install two spacers, one should be installed at the top and the other at the bottom so that the spring seat will not be prevented from piloting the spring.

In cases where a car sags to the driver's side and the high limit spring has been used on the driver's side, the use of one spacer between the spring and seat insulator will usually level the car to a satisfactory point.

SERVICING FRONT SUSPENSION

41-4260-80, 46-47-4840-60 Series

Where the alignment factors vary considerably outside the specifications, this will result in hard steering and abnormal tire wear.

1. Caster

Refer to page 4.

41-4260-80, 46-47-4840-60 Series

This type of front suspension uses a "C" washer to vary the relationship between the upper control arm inner pivot and the upper control frame bracket (Fig. 11). To adjust caster, simply loosen the nuts at the inner end of the pivot bar frame bracket screws and insert additional "C" washers at either point "A" or point "B". Adding washers at point "A" decreases the caster angle, and adding washers at point "B" increases the caster angle.

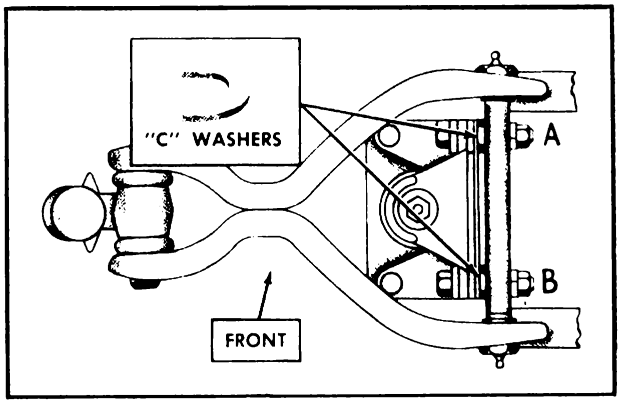


Figure 11—Caster and Camber adjustments on the 41-4260-80, 46-47-4840-60 Series are made by inserting and removing "C" washers at points "A" and "B".

These "C" washers are 1/16" thick and each one added represents a change of 1/3 of a degree in the caster angle.

2. *Camber*

Refer to page 4.

41-4260-80, 46-47-4840-60 Series

Camber adjustments on these series are very similar to the caster adjustments. (Fig. 11.) Loosen the two nuts at "A" and "B" on the inner end of the pivot bar frame bracket. Then, to decrease camber, add equal number of "C" washers both at "A" and "B". To decrease camber, remove an equal number of "C" washers from both "A" and "B". By removing or adding the same quantities at both "A" and "B" you will change the camber as you wish without affecting the caster adjustment previously made.

3. *Kingpin Angle*

Refer to page 4.

41-4260-80, 46-47-4840-60 Series

The angle of the kingpin on this type of front suspension cannot be adjusted independently of camber. The angle is built into the suspension assembly and, if it is off after camber has been corrected, it means that some part, usually the steering knuckle, has been damaged and must be replaced.

4. *Toe-In*

Refer to page 5.

46-47-4840 Series

In this series a center steering idler lever, which is connected to the main front cross member by a bolt and bushing joins the two tie-rod ends. (Fig. 12.) A drag link connects the steering arm with the idler lever. To adjust toe-in be sure that the steering gear and the ball arm are in their mid-position and the front wheels are straight ahead. Loosen the adjusting tube clamp screw on both tie-rods and turn each tube the same amount until the wheels are toeing in as specified. Refer to pages 16, 17. Tighten all clamp screws after the job has been completed.

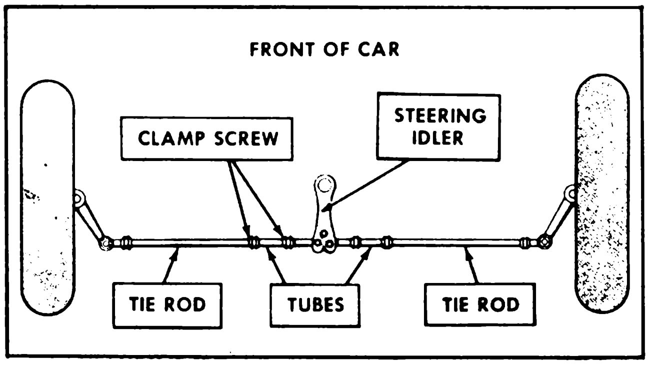


Figure 12—The 46-47-4840 Series Linkage features two equal tie rods connected to a steering idler lever.

4180-4260-80, 46-47-4860 Series

These series have two tie-rods connected together by a relay rod (Fig. 13). To adjust toe-in loosen the clamps at both ends of the adjusting tubes on each tie-rod. Then with the wheels straight ahead and the steering gear in the mid-position, turn the adjusting tubes in opposite directions. To obtain the correct position of the steering wheel it is important that you always turn both tubes equally and in opposite directions. In other words, half of the toe-in dimension should be taken by each tie-rod.

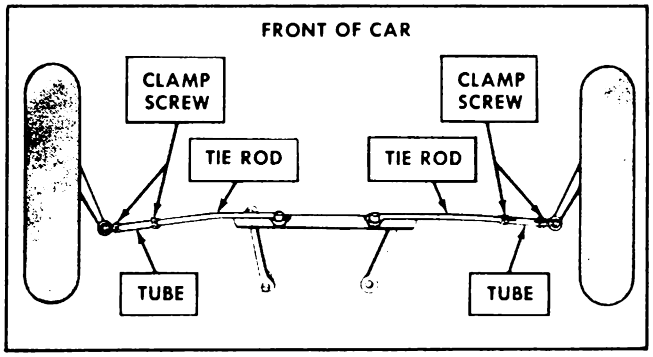


Figure 13—4180, 4260-80, 46-47-4860 Series features two equal tie rods connected by a relay rod.

When the correct adjustment has been made tighten all clamp screws.

4140-60, 4240 Series

The steering linkage on these series consists of two tie-rods connected together. One of them is, in turn, connected to the steering ball arm (Fig. 14). To correct toe-in on these series, place the steering gear in mid-position, loosen the clamp screw at the outer end of each tie-rod, and turn each tube separately until both wheels are perfectly straight ahead. Then lengthen each tie-rod the same amount until toe-in is correct according to the specifications on pages 16, 17. Be sure to tighten all clamp screws when the corrections have been made.

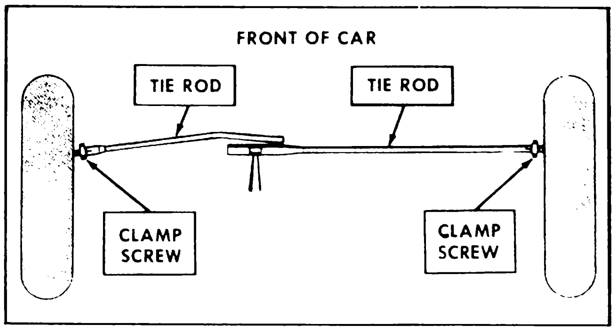


Figure 14—4140-60, 4240 Series the steering arm is connected directly to one of two tie rods.

Toe-Out

Refer to page 5.

Some preliminary checks are necessary before any attempt is made to adjust caster, camber, or toe-in. (See Items 1 to 14 on page 5.)

Wheel Run-Out—All Series

Radial run-out or an eccentric wheel should not exceed 1/8″. Always correct or replace a bent or eccentric wheel.

Wheel and Tire Balance—All Series

Wheels and tires must always be maintained within satisfactory limits of balance, otherwise high speed shimmy or wheel tramp will result. This is also a factor in connection with unsatisfactory tire wear.

Shock Absorbers—All Series

Properly performing shock absorbers are essential for satisfactory steering. Where a shock absorber is found to be inoperative, it is usually necessary to replace the complete unit as it is not generally recommended that these units be serviced or the fluid replenished.

Setting Front Wheels in Straight Ahead Position

To maintain the steering wheel spoke in the horizontal position while the car is being driven straight ahead, first see that the steering gear is in the center of its travel. Next, make sure that the wide serration at the upper end of the steering gear tube is in line with the mark on the steering wheel hub. Then it will be necessary to adjust the steering tie-rods, as outlined on pages 16, 17.

LUBRICATION OF FRONT SUSPENSION

41-4260-80, 46-47-4840-60 Series

The threaded bushings in this type of front end suspension require thorough lubrication, with the weight of the car off the bearings. This procedure is necessary to insure against squeaks prior to the next 1,000-mile lubrication.

STEERING GEARS

41-4260-80, 46-47-4840-60 SERIES STEERING GEARS

Description

The steering gear used in these series is of the worm and roller type. The worm is mounted to the lower end of the steering tube. The roller is a part of the roller shaft, the two together form a worm and roller drive. When the steering wheel is turned, the worm turns the roller shaft, as shown in Fig. 15.

For the steering gear to function efficiently, it is very important that all play be eliminated when the front wheels are straight ahead. Means have been provided to remove all end play in the worm and shaft assembly, also in the roller shaft assembly, so that the end play between the worm and roller can be controlled.

In this type of gear, major adjustments are accomplished through the use of shims. The need for adjustments should only be after considerable usage.

Before making any adjustments, jack up the front wheels of the car and make sure that all other factors affecting the steering have been considered, as outlined on page 5.

Inspection for Proper Worm Bearing Adjustment—All Series

Turn steering wheel about one turn to right from straight ahead drive position. Secure in this position to prevent any oscillation when front wheels are shaken violently. This can be done by tying one spoke to a left side door column and holding the wheel against it as a brace. Grip the steering

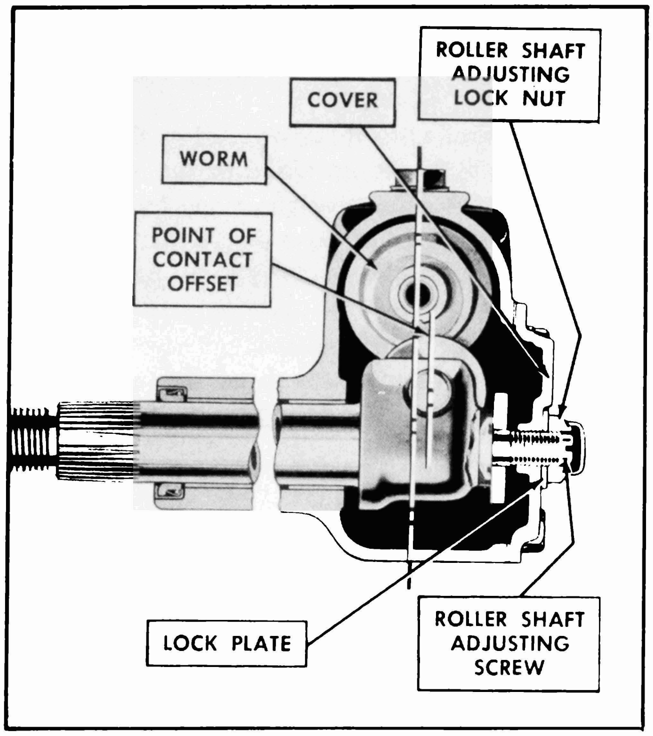


Figure 15—41-4260-80, 46-47-4840-60 Series Steering Gear.

column with the other hand just below the steering wheel hub with the side of one finger barely touching the lower end of the wheel hub. Now have a helper shake the front wheels hard sidewise. This will enable any end play in worm bearings to be felt at wheel hub. If any end play exists, worm bearings need adjusting. Be sure end play is felt, and that it is not confused with play or give in the jacket bushing. Worm bearing adjustment should be corrected before further inspection of the gear is made.

Worm Bearing Adjustment—All Series

Loosen four worm cover screws ⅛ inch (Fig. 16). Use a knife to separate the top shim, passing blade all the way around between shims, care being taken not to mutilate the remaining shims. Remove only one shim at a time between inspections, to remove end play. Care should be taken not to set up stiffness in worm bearings.

It is important that the drag link be removed from the steering gear ball arm in order to inspect the other steering gear adjustments. Now revolve the steering wheel to determine if any stiffness exists. If so, too many shims have been removed or the gear is misaligned in the car.

Steering Gear Alignment—All Series

Loosen the frame bracket bolts just enough to allow the gear to shift in the frame and line up with the instrument panel gear bracket. Re-tighten frame bracket bolts. Now loosen the instrument panel gear bracket and allow it to shift to match the gear column position, and re-tighten. This will correct any possible misalignment of the gear column.

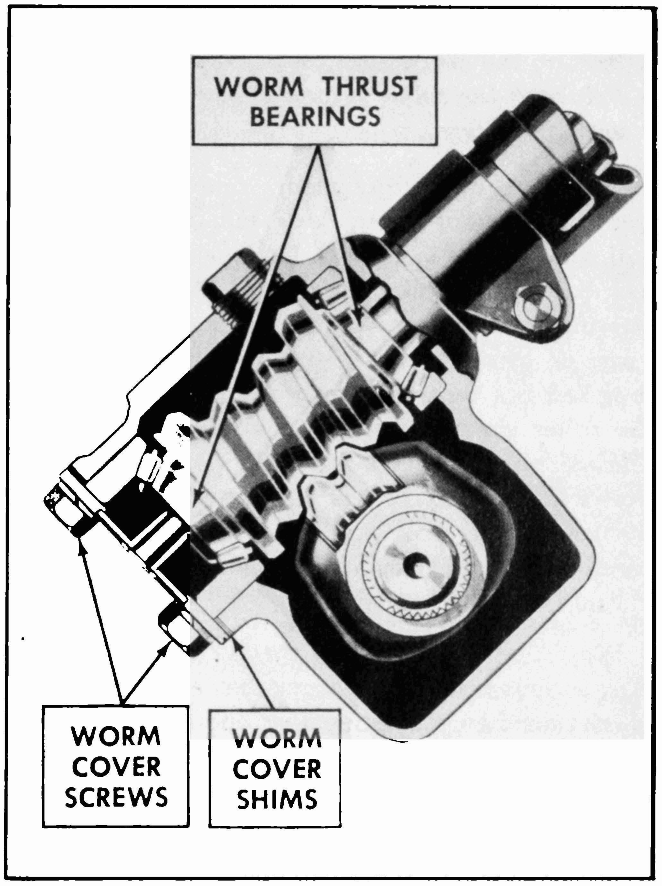


Figure 16—The Nash Steering Gear—Side View.

Inspection for Proper Mesh of Roller Shaft in Worm—41-4260-80, 46-47-4840-60 Series

(Never make inspection for proper mesh without first correcting the column adjustment and gear alignment.) Turn the steering wheel to the mid-position of its complete travel or turning limits. (Drag link must be disconnected.) The steering wheel has a line on the under side of the hub that should now point straight down, when location is nearest to the mid-position. Place this marked spoke in the correct position and shake the ball arm to determine the amount of lost motion. If this lost motion exceeds 1 32 of an inch, the roller shaft adjustment should be made.

CAUTION: *To obtain a closer mesh of the roller shaft with the worm, adjust the outside roller shaft adjusting screw.*

The center of roller is offset from the center line of the worm, hence when the screw is tightened the roller is moved into closer mesh with the worm.

To make the adjustment, remove the roller shaft adjustment screw lock nut (see Fig. 15), and slide off the lock plate far enough to clear the lock boss on the roller shaft cover. Now be sure the steering wheel is located in mid-position of wheel turns or straight ahead driving position and the drag link has been previously disconnected. Tighten the roller shaft adjustment screw just enough to remove play between the roller shaft tooth and worm. Check this by the amount of play felt at the end of the ball arm. It is better to leave a slight amount of play at this point than to tighten too much.

When tightened beyond the point of taking up lash, serious results will occur that are a detriment to continued good steering gear operation.

Now slide the lock plate in position against the roller shaft cover and into locked position. Replace the roller shaft adjustment screw lock nut and tighten it.

Assembly of Gear Into Car—All Series

When re-assembling the jacket on the gear, use nothing but castor oil on the jacket bushing. Refer to page 13 for steering gear alignment in the car.

Lubrication—All Series

Remove the oil filler plug and vent hole cover. (See Fig. 16.) Fill with approved lubricant until the oil vent overflows. Replace the oil filler plug and vent hole cover to prevent dirt from entering the housing.

Avoid use of graphite, white lead, or heavy solidified oil.

If these adjustment instructions are followed carefully and CORRECT lubrication used, proper functioning of the steering mechanism will result. Do not deviate from these instructions to correct any erratic action of the front wheels, such as shimmy or steering wheel fight, but instead see that tires are properly inflated and the front axle checked for correct toe-in, camber and caster specifications. Shock absorber tension or adjustment should be at the recommended standard. Tie-rod and drag link sockets or connections must also be adjusted to correct tension and freedom.

41-4240 SERIES STEERING GEAR

Description

This gear is similar to the gear used in the 60 and 80 series, with the exception that the worm and roller shaft mesh adjustment is made by removing or adding shims behind the roller shaft (Fig. 17). This requires that the steering gear be removed from the car.

Inspection for Proper Mesh of Roller Shaft with Worm—41-4240 Series

(Never make inspection for proper mesh, without first correcting roller shaft and column adjustments.) Turn the steering wheel to the mid-position of its complete travel or turning limits. (Drag link must be previously disconnected.)

The high point of the worm is indicated by the wide serration of the column tube and it should point straight down. Place this marked spoke in the correct position and shake the ball arm to determine amount of lost motion. If this lost motion exceeds 1/32 inch, roller shaft adjustment should be made; in which case, gear must be removed from car.

Caution: *Before drag link is again connected to steering gear ball arm, swing front wheels throughout their turning radius to determine if any tight spots exist. There should not be more than 10 lbs. pull on the drag link either forward or backward throughout entire turning radius.*

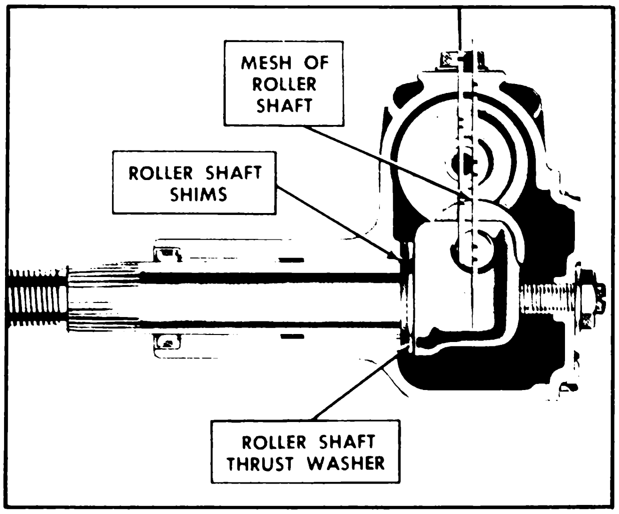


Figure 17—41-4240 Series Steering Gear.

When Gear Is Removed from Car— 41-4240 Series

Hold the gear in a vise so the column is to the right, remove the roller shaft (Fig. 17) from the gear housing and replace the steering wheel on the column. If proper worm bearing adjustment has not been accomplished, readjust according to previous instructions. Note that the roller shaft thrust washer (Fig. 17), is assembled with the chamfered side next to the roller shaft thrust face.

Roller Shaft Mesh with Worm— 41-4240 Series

Adjustment for closer mesh of the roller shaft with the worm is accomplished by the removal of shims from behind the roller shaft thrust washer. The center of the roller is offset from the centerline of the worm, hence when a shim is removed, the roller is moved into closer mesh with the worm.

Select, through trial, the proper number of shims to produce not more than .006″ play measured at the end of the ball arm, and without heavy drag on steering wheel. Remove only one shim from the roller shaft (Fig. 13), and insert the roller shaft in the housing. Then turn the steering wheel nearly to left stop. Now hold the roller shaft in place with thumb pressure on the head end of the roller shaft, and revolve the steering wheel to the right until the roller shaft is in the center of the worm. (Do not reverse turn to left.) Still holding the roller shaft with the other hand, try to rotate it. If any play exists, remove another shim and repeat the operation until the play felt by hand in the center of the gear is removed.

When the proper number of shims has been selected, turn the steering wheel close to either stop and reassemble the roller shaft cover (Fig. 17); tighten screws securely. (Drive the ball arm onto the roller shaft.) Now loosen the roller shaft adjustment screw lock nut (Fig. 17), and tighten the roller shaft adjustment screw until all end play in the roller shaft has been removed when gear shaft is rotated in this lash position, near the end of the worm. Lock the roller shaft adjustment screw lock nut and re-inspect the gear for freedom of operation. There should be no end play in the roller shaft adjustment.

FRONT SUSPENSION STEERING GEAR SPECIFICATIONS

Year Series	4140	4240	4640	4740	4840
Type	Independent Frt. Wheel (Lancia)	Independent Frt. Wheel (Lancia)	Independent Frt. Wheel	Independent Frt. Wheel	Independent Frt. Wheel
Front Wheel Tread Inches	56″	56″	56 13/16″	56 13/16″	57½″
Rear Wheel Tread Inches	59¾″	59¾″	59¾″	59¾″	59 11/16″
Camber Degrees	0°-½°	0°-½°	¼° = ¾°	¼° = ¾°	¼° = ¾°
Caster Degrees	0° ± ¼°	0° ± ¼°	+ ¼° + ¾°	+ ¼° + ¾°	+ ¼° + ¾°
Toe-in-Inches	0″-1/16″	0″-1/16″	⅛″-3/16″	⅛″-3/16″	⅛″-3/16″
King Pin Angle—Degrees	5½°	5½°	7½°	7½°	7½°
Front Coil Spring Free Length	14 1/16″	14 1/16″	15½″	15½″	15½″
Front Coil Spring Length Under Curb Weight	9 7/16″	9 7/16″	9⅞″	9⅞″	9⅞″
Car Turning Radius	16.5′	19′	20.5′	20.5′	22.6′
Road Clearance	7½″	7½″	7½″	7½″	7½″

STEERING GEAR SPECIFICATIONS

Type	Worm & Roller	Worm & Roller	Worm & Roller	Worm & Roller	Worm & Roller
Make	Gemmer	Gemmer	Gemmer	Gemmer	Gemmer
Steering Gear Ratio	18.2-1	18.2-1	18.2-1	18.2-1	18.2-1

FRONT SUSPENSION STEERING GEAR SPECIFICATIONS

Year Series	4160	4260	4660	4760	4860
Type	Independent Frt. Wheel	Independent Frt. Wheel	Independent Frt. Wheel	Independent Frt. Wheel	Independent Frt. Wheel
Front Wheel Tread Inches	57½″	57½″	57½″	57½″	57½″
Rear Wheel Tread Inches	60½″	60½″	60½″	60½″	60½″
Camber Degrees	¼°-¾°	¼°-¾°	¼°-¾°	¼°-¾°	¼°-¾°
Caster Degrees	0°-½° Neg	0°-½° Neg	0°-½° Neg	0°-½° Neg	0°-½° Neg
Toe-in-Inches	1/16″-3/16″	1/16″-3/16″	1/16″-3/16″	1/16″-3/16″	1/16″-3/16″
King Pin Angle—Degrees	4½°	4½°	4½°	4½°	4½°
Front Coil Spring Free Length	14 13/16″	14 13/16″	14 13/16″	14 13/16″	14 13/16″
Front Coil Spring Length Under Curb Weight	9″	9″	9″	9″	9″
Car Turning Radius	19′	19′	19′	19′	20.11′
Road Clearance	8¾″	8¾″	8½″	8½″	8½″

STEERING GEAR SPECIFICATIONS

Year Series	**4160**	**4260**	**4660**	**4760**	**4860**
Type	Worm & Roller	Worm & Roller	Worm & Roller	Worm & Roller	Worm & Roller
Make	Gemmer	Gemmer	Gemmer	Gemmer	Gemmer
Steering Gear Ratio	18.2-1	18.2-1	18.2-1	18.2-1	18.2-1

FRONT SUSPENSION STEERING GEAR SPECIFICATIONS

Year Series	**4180**	**4280**	
Type	Independent Frt. Wheel	Independent Frt. Wheel	
Front Wheel Tread Inches	57″	57″	
Rear Wheel Tread Inches	61¼″	61¼″	
Camber Degrees	¼°-¾°	¼°-¾°	
Caster Degrees	0°-½° Neg	0°-½° Neg	
Toe-in-Inches	1/32″-3/32″	1/32″-3/16″	
King Pin Angle—Degrees	4½°	4½°	
Front Coil Spring Free Length	15⅜″	15⅜″	
Front Coil Spring Length Under Curb Weight	9¼″	9¼″	
Car Turning Radius	19¾′	19¾′	
Road Clearance	8½″	8½″	

STEERING GEAR SPECIFICATIONS

Type	Worm & Roller	Worm & Roller	
Make	Gemmer	Gemmer	
Steering Gear Ratio	20.25-1	20.25-1	

FRAME-SPRINGS-SHOCK ABSORBERS SECTION

Nash

TECHNICAL
MANUAL

FRAME 2

FRAME ALIGNMENT 2

BODY MOUNTINGS 4

SPRINGS 6

FRONT COIL SPRINGS 6

REAR SPRINGS 7

SPRING SHACKLES 7

SHOCK ABSORBERS 8

SHOCK ABSORBER INSPECTION 8

SHOCK ABSORBER SPECIFICATIONS 9

SPRING SPECIFICATIONS 10

FRAME - SPRINGS - SHOCK ABSORBERS SECTION

NASH TECHNICAL MANUAL

FRAME

Description

The frame is the foundation of the entire car. All other parts are attached to it, either directly or indirectly, and unless it is in perfect alignment, none of the other chassis parts can be in alignment.

41-42-46-47-4840 Series

The frame and body are integral, the box-section upper structure, the box-section pillars and the strong frame and floor section are all welded together. This forms a single, all steel unit, adding the strength of the frame to that of the entire body.

The construction of the underbody incorporates a box-section frame to support the front suspension, power plant, rear springs and axle. The cross member that serves as the front axle for the front suspension and the engine rear support are removable to facilitate servicing of these units. They are bolted to the body frame.

The method of inspecting the frame alignment does not change from that used for the conventional type of frame. The method of repair will be covered in the Body Section of this Manual.

41-4260-80, 46-47-4860 Series

This frame is of the conventional design and consists of heavy gauge side rails with a welded box section for the greater portion of their length. Beyond the box section, side rails extend front and rear in the form of a deep-draw "U" channel.

FRAME ALIGNMENT

The various dimensions that can be used as a single guide in checking frame alignment are shown in Figs. 1 through 4. The dimensions given are the true length in inches between the two points as measured with a steel tape. Fig. 1 shows a few of the diagonal measurements that may be taken to check the squareness of the frame. Diagonal measuring will quickly determine which section of the frame is bent and where force should be applied to restore correct alignment.

To check a frame for alignment, diagonal measuring should be performed with the greatest of accuracy and care.

Measurements may be taken from the chassis by using a plumb-bob and a chalk-line as follows:

1. Place the car on a level floor.
2. Attach the line of the plumb-bob to the center of one of the rear body bolts at the rear of the frame and to a point common to both sides at the front as 1, 2, 3, 4, 5, and 6. (Fig. 1.) The plumb-bob should be suspended slightly above the floor. When the plumb-bob comes to rest, mark the floor directly underneath it. Move to the next point and mark the floor again until all points have been marked on the floor.
3. Move the car away so that the distance marked on the floor can be measured.
4. Measure from Point 6 to Point 3, in Fig. 1, and from Point 5 to Point 4. These two distances should be equal within 3/8". If the error is in excess of that, the frame should be straightened.
5. Measure from Point 1 to Point 4 and from Point 2 to Point 3. These two measurements should be within 3/16" of each other or that section of the frame is out of alignment.
6. Measure from Point 1 to Point 6 and from Point 2 to Point 5. These measurements should be within 3/16" of each other.

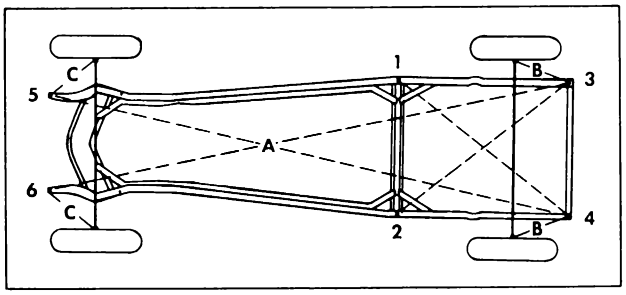


Figure 1—Measurements to be taken when checking frame alignment.

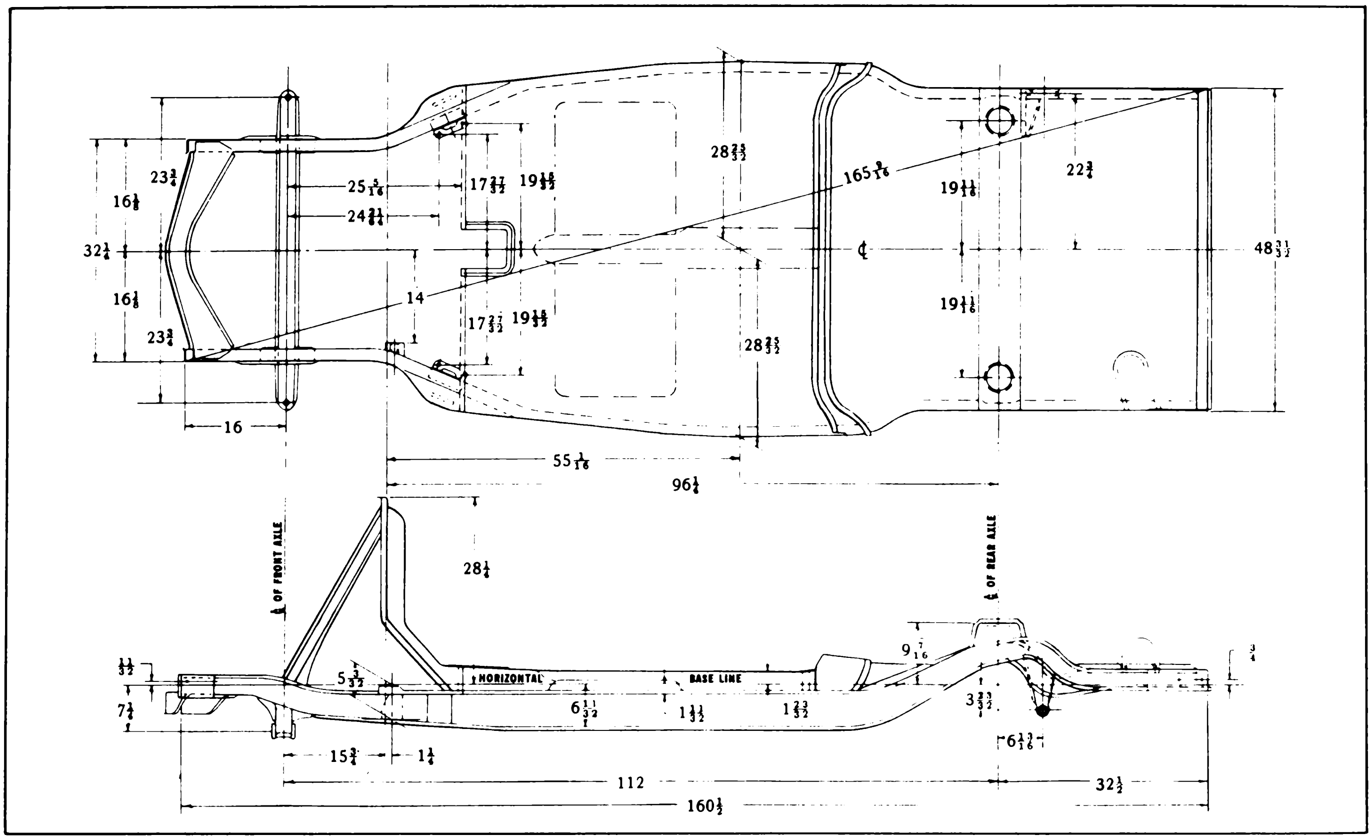

23¾
16⅛
32¼
16⅛
23¾
16
25 5/16
24 21/64
17 27/32
19 15/32
14
17 27/32
19 15/32
28 25/32
165 9/16
19 11/16
22¾
48 31/32
19 11/16
28 25/32
55 1/16
96¼
℄ OF FRONT AXLE
28¼
℄ OF REAR AXLE
11/32
7¼
5 3/32
HORIZONTAL
BASE LINE
6 11/32
1 11/32
1 23/32
9 7/16
3 23/32
¾
15¾
1¼
6 13/16
112
32½
160½

Figure 2—41-4240 Series Frame Straightening Dimensions.

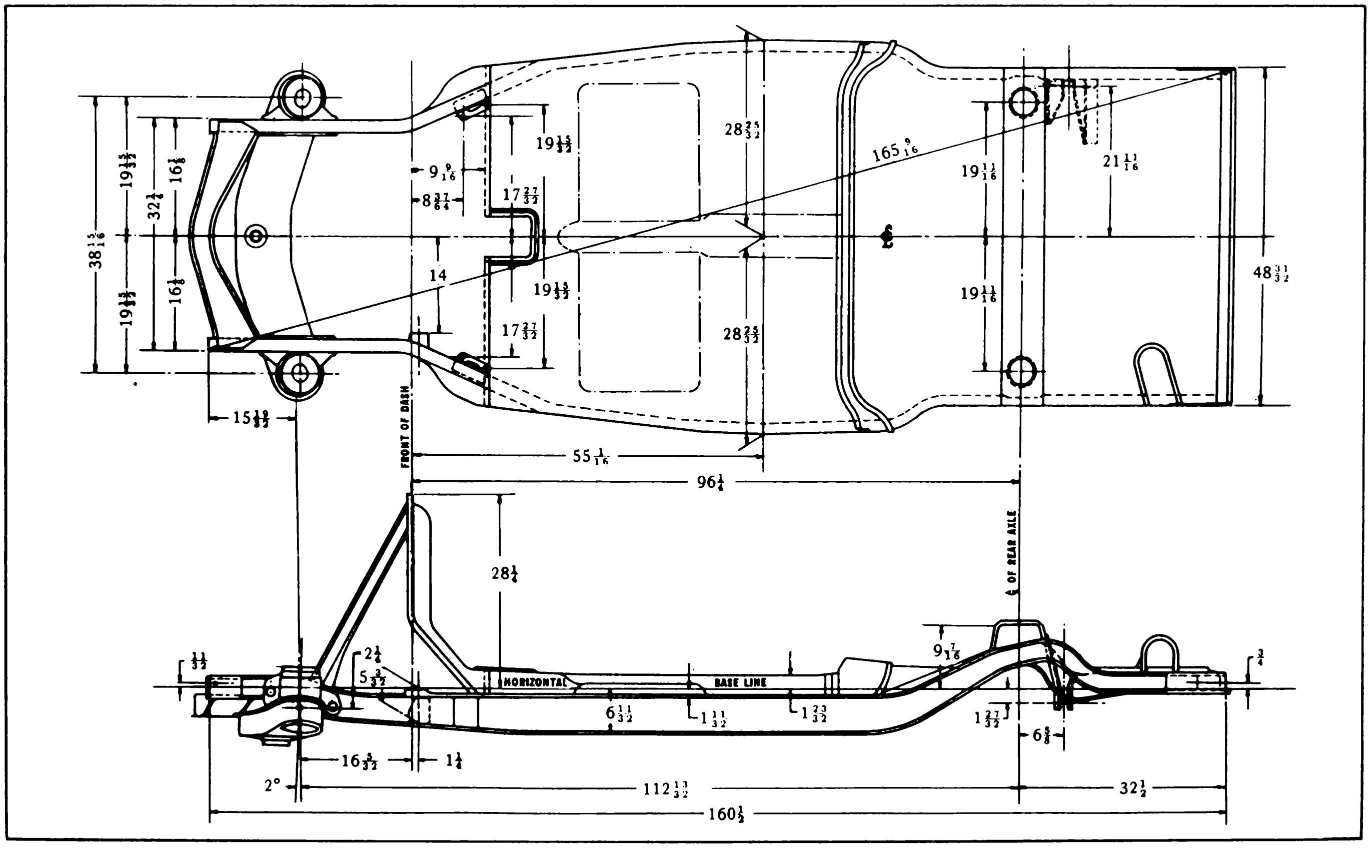

38 15/16
19 15/32
32¼
16⅛
16⅛
19 15/32
19 15/32
9 9/16
8 31/64
17 27/32
14
19 15/32
17 27/32
28 25/32
28 25/32
165 9/16
19 11/16
21 11/16
48 31/32
19 11/16
15 15/32
FRONT OF DASH
55 1/16
96¼
28¼
℄ OF REAR AXLE
11/32
2¼
5 3/32
HORIZONTAL
BASE LINE
6 11/32
1 11/32
1 23/32
9 7/16
1 27/32
6⅝
¾
16 5/32
1¼
2°
112 13/32
32½
160½

Figure 3—46-47-4840 Series Frame Straightening Dimensions.

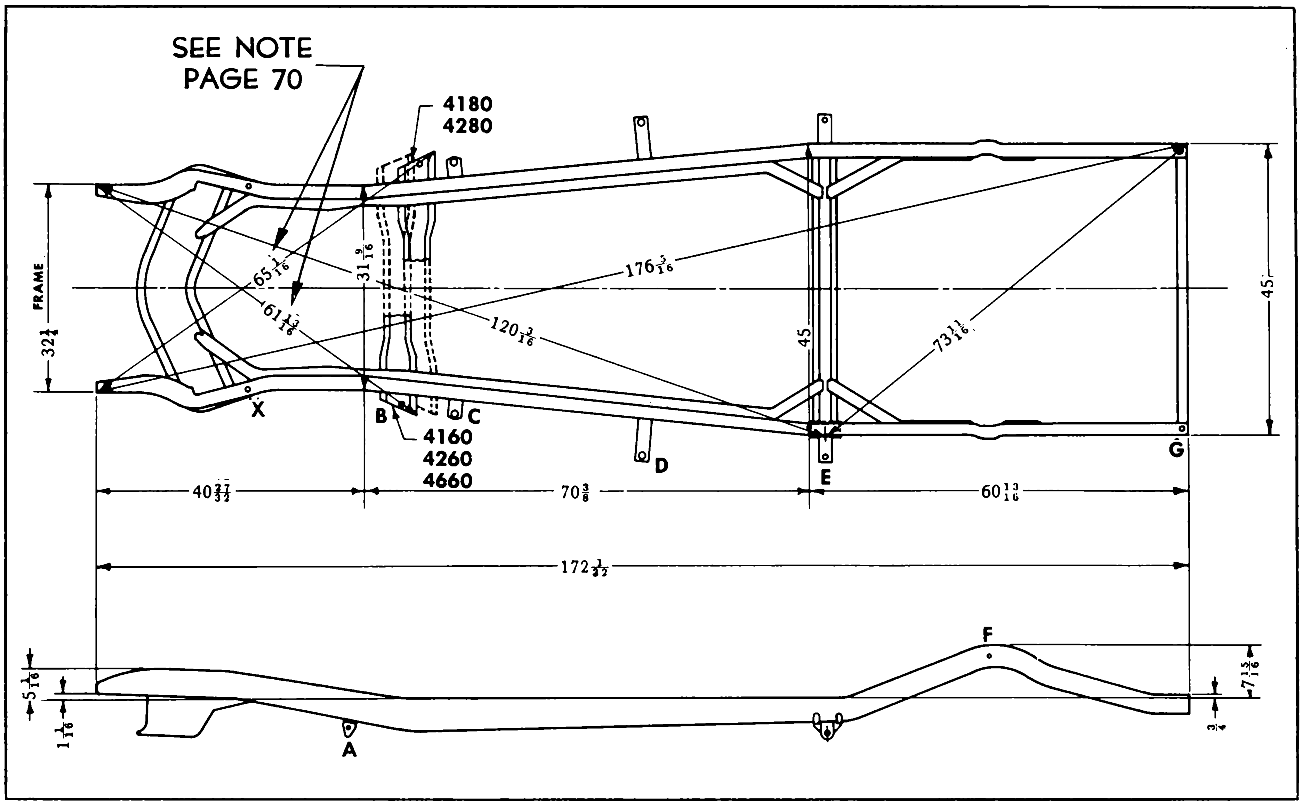


Figure 4—41-4260-80, 46-47-4860 Series Frame Straightening Dimensions.

The diagonals shown in Fig. 1 are only a few that may be taken. Any section of the frame can be checked in the same way. This method will assist in checking a body bracket that is bent and has to be straightened.

CAUTION: *When using the above method for checking frame alignment, make sure that the points used for the diagonals are corresponding points on each side of the frame.*

Engine Rear Support 46-47-4840 Series

Starting with the 4640 series the engine rear support frame cross member was changed to provide adequate support for the larger transmission used in this series. This cross member has a rubber insulating pad known as the engine rear support between the cross member and the transmission. By using an insulating pad adaptable to the 41-4240 series the new cross member can be used on these series. The 41-4240 rear engine frame cross member has been discontinued in service stock. The 4840 rear engine frame cross member will be available with an adapter pad and engine rear support pad.

BODY MOUNTINGS

41-4260-80, 46-47-4860 Series

Body mountings are located at sixteen points on these series cars as shown in Fig. 5. The right and left are identical at the relative locations. Body mounting cushions shown in black are live rubber and those shown shaded are "fabrica" or rubberized fabric.

Front Body Mounting

Location "X" on Fig. 4.

The front body mounting consists of a flanged steel sleeve, welded to the body sill with the flange down. A live rubber cushion, with a moulded flange, is installed from below, with a flanged steel sleeve of definite length, so that when the front body bolt nut is drawn up tight the rubber will form a flange at the top, the tension of the rubber being limited by the length of the steel sleeve, and a large steel washer being provided at this point.

Second Body Mounting

Location "A" on Fig. 4.

The second body mounting consists of a fabrica cushion between the outer side of the frame side

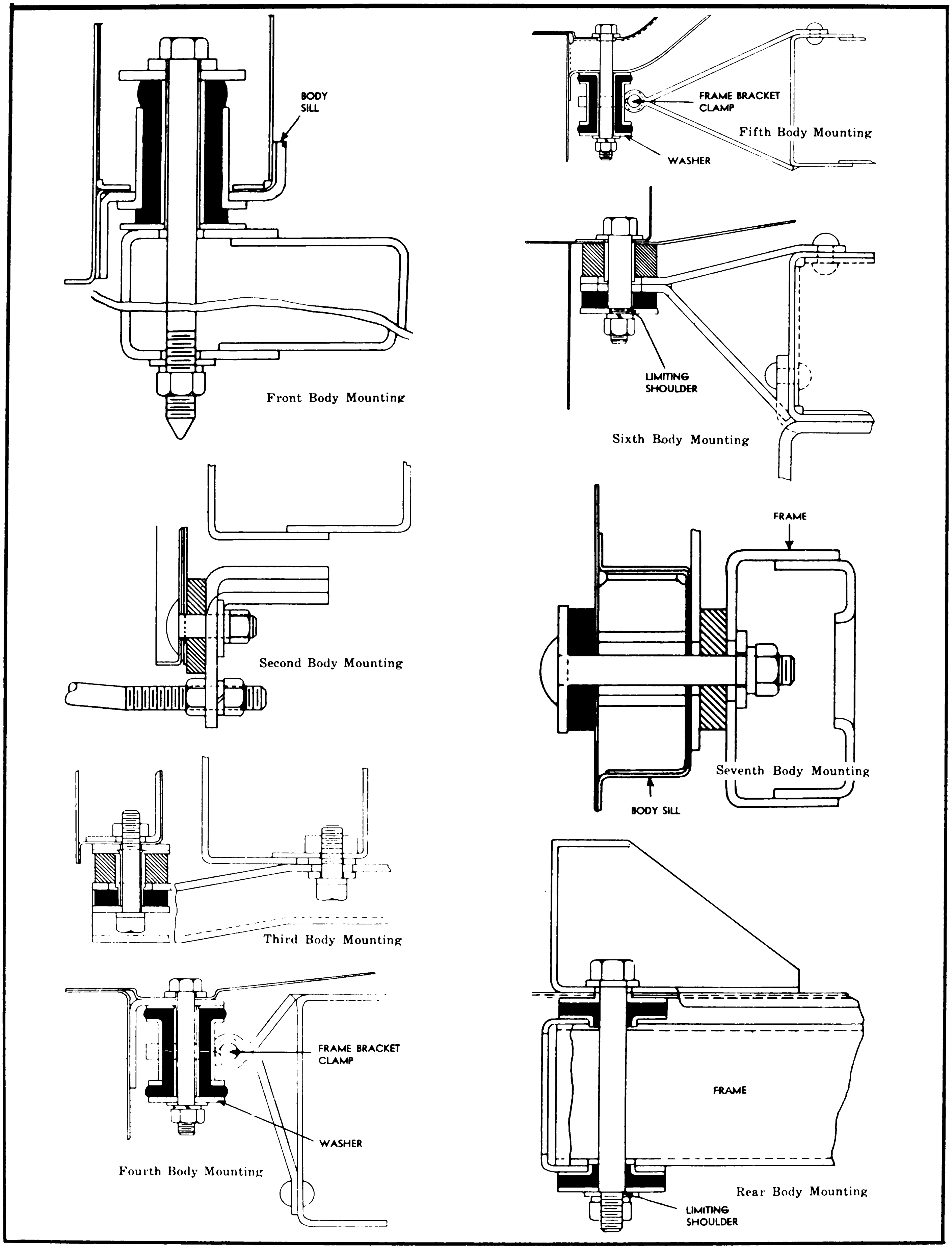

BODY SILL
Front Body Mounting
FRAME BRACKET CLAMP
Fifth Body Mounting
WASHER
LIMITING SHOULDER
Sixth Body Mounting
Second Body Mounting
FRAME
Seventh Body Mounting
BODY SILL
Third Body Mounting
FRAME BRACKET CLAMP
WASHER
Fourth Body Mounting
FRAME
Rear Body Mounting
LIMITING SHOULDER

Figure 5—Body Mounting Bolts 41-4260-80, 46-47-4860 Series.

rail and the body sill. There is no limiting adjustment at this point, the retaining nut being drawn up tight.

Third Body Mounting

Location "B" on Fig. 4.

The third body mounting consists of a live rubber cushion below the rear engine support cross member which extends beyond the frame side rails at this point. A fabrica cushion is used between the cross member and the body sill. The mounting bolt threads into a nut, which is welded to the body sill. The tension on the rubber and fabrica cushions is limited by a limiting sleeve around the bolt. In mounting a body it is recommended that this point be assembled first, but not tightened, due to possible difficulty in lining up the bolt with the nut welded to the body sill.

Fourth and Fifth Body Mounting

Locations "C" and "D" on Fig. 4.

The fourth and fifth body mountings are the same in principle and consist of live rubber cushions, with a moulded flange at one end, two of these cushions being used at each point. A flanged steel sleeve, installed from above, having a definite length, limits the tension on the rubber cushions when the body mounting bolt nuts are drawn up tight. The two rubber cushions are, furthermore, confined by a flanged steel sleeve which is clamped in a slotted frame bracket. In mounting the body, the clamp screws at the frame brackets are tightened to hold the body sill in correct relation to the frame so that it will not be under strain. Strain set up at these points might result in vibrations which would be attributed to mechanical parts of the car.

Sixth Body Mounting

Location "E" on Fig. 4.

The sixth body mounting consists of a fabrica cushion between the frame bracket and the body sill. A live rubber cushion is installed below the frame bracket and the tension on this cushion is limited by the mounting bolt which is of the shoulder type.

Seventh Body Mounting

Location "F" on Fig. 4.

The seventh body mounting, like the second, is on the outside of the frame side sill. It consists of a live rubber cushion on the outside of the body sill and a fabrica cushion between the body sill and the side rail. The body sill box section is furthermore provided with a spacer sleeve to prevent the box section from collapsing when the body mounting bolt nut is drawn up tight.

Rear Body Mounting

Location "G" on Fig. 4.

The rear body mounting consists of a steel and rubber cushion with a pilot flange which pilots in the frame side rail between the body sill and the top side of the frame side rail. Another identical cushion is installed from below with the flange piloted in the underside of the frame side rail. The mounting bolt is of the shoulder type so that when the body mounting bolt nut is drawn up tight the tension on the rubber cushions is limited.

Mounting the Body on the Frame

When the body is mounted on the frame and the various parts installed, as described previously, BUT NOT TIGHTENED, draw down the third and sixth mounting bolt nuts tight. Then tighten the fourth and fifth mounting bolt nuts with the frame bracket clamp screws loose. Now tighten the frame bracket clamp screws. Finally, tighten the other mounting points as described.

SPRINGS

Description

Coil springs are used on both front and rear of the 41-42-46-47-4840 Series and on the front only, of the 41-4260-80, 46-47-4860 Series. These springs are insulated from contact with the axle and the body by rubber cushions that prevent the transmission of road noises to the body. The Semi-Elliptic type of rear springs are used on the 41-4260-80, 46-47-4860 Series.

FRONT COIL SPRINGS

41-4260-80, 46-47-4840-60 Series

These front coil springs must always be used in pairs on an individual car. They are not interchangeable between series, as the spring height varies. The '40 series front coil springs have an approximate 15½ inches free height, whereas, the '60 series have 14⅞ inches free height. Refer to Spring Specifications, page 10. The '40 series spring under the specified 1140 pound load, plus or minus 40 pounds, is approximately $9\frac{7}{8}$ inches high. The '60 series spring under a 1930 pound load (specified), plus 60 or minus 30 pounds, is 9 inches high. The '40 series springs have a rate of 210 pounds per inch and the '60 series springs have a rate of 350 pounds per inch. This means that starting at the specified loaded height, the springs will compress 1 inch for every additional 210 or 350 pounds of load as specified for that particular spring.

The limits referred to in connection with the loaded height are identified by one grind mark at the end coil for low limit, and two grind marks at the same point for the high limit. Now if a pair of springs, consisting of one to the low limit, which is one grind mark, and the other to the high limit, which is two grind marks, is used on the same car, it is advisable to install the high limit spring (two grind marks) to the left on the driver's side, as in many cases the car is operated with only the driver load. Identification of these springs may be readily made by checking the free height to the aforementioned approximate dimensions.

Where additional height is required on the '60 series to prevent the springs from bottoming or from riding through in rough territories, a $\frac{1}{4}$ inch thick spacer, supplied under Part No. 3104309, may be used to increase the riding height. One of these spacers installed between the lower end of the coil spring and the insulator will increase the riding height by slightly more than $\frac{1}{2}$ inch, which is because of the leverage of the front suspension control arms. In extreme cases where it is necessary to install two spacers, one should be installed at the top and the other at the bottom in order to eliminate the possibility of the spring being dislodged from the seat.

REAR SPRINGS

41-4260-80, 46-47-4860 Series

A Semi-Elliptic type of spring is used in these series. This spring is of the tapered leaf type, using an anti-friction bearing metal inset between the ends of the spring leaves.

To prevent tire and road noises from telegraphing up through the frame and into the body, the front end of the rear spring as well as the rear upper shackle point are insulated with rubber.

41-42-46-47-4840 Series

A coil spring is used in these series. This spring is between the rear axle and the body, sitting in insulated spring pads both top and bottom. In this construction the only duty of the spring is to support the weight of the body, but it should be checked in service for the correct spring height the same as the front spring. (Refer to the spring specifications on page 10.)

Rear Spring Front Mountings—
41-4260-80, 46-47-4860 Series

The rear spring front bracket is riveted to the frame side rail. This bracket is in the shape of a "U" and has a large hole on the outside section for the rear spring front eye bolt.

Two rubber bushings insulate the front spring eye from the bolt. These rubber bushings have a moulded flange as shown in Fig. 6. One rubber bushing is installed on the bolt with the flange toward the head and the other in the spring eye with the flange toward the inside of the car. The bolt is installed from the outside and when the nut is drawn up tight the tension on the rubber is limited by the shoulder of the bolt. A heavy lockwasher is used under the nut and the nut should be drawn up tight. *No Lubrication Required.*

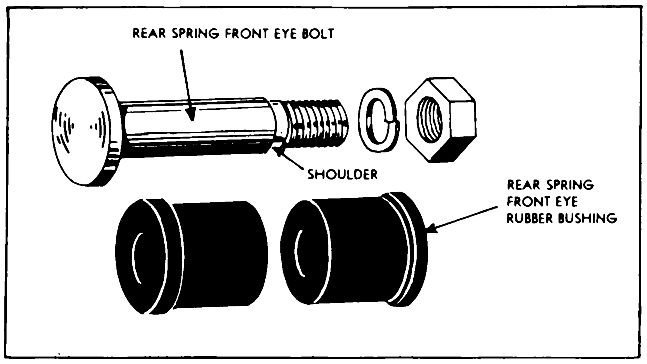

REAR SPRING FRONT EYE BOLT
SHOULDER
REAR SPRING FRONT EYE RUBBER BUSHING

Figure 6—Rear Spring Front Mounting 41-4260-80, 46-47-4860 Series.

SPRING SHACKLES

Rear Spring Shackle—
41-4260-80, 46-47-4860 Series

Rear spring shackles, right and left, are different in that the thread on the lower part of the "U" shackle is right hand on the left, and left hand on the right. This prevents the rear spring rear eye from unwrapping when the shackle bushing is drawn up tight. Tightening the threaded bushing in the spring eye has the tendency to wrap the eye of the spring tighter.

The upper threaded shackle bushing, as shown in Fig. 7 has a live rubber casing vulcanized to the outside, which is in turn, confined to a metal sleeve. When the frame bracket is drawn up tight after the shackle bushing has been installed on the shackle the rubber is held under proper tension.

When shackle bushings are drawn up into position they should be checked to make sure that the threaded end of the shackle does not bottom in the bushing, as this would result in a bind and cause the shackle to fail, or in the failure of a rear spring main leaf just ahead of the rear eye.

Pressure fittings are provided to lubricate the threads on the "U" shackle.

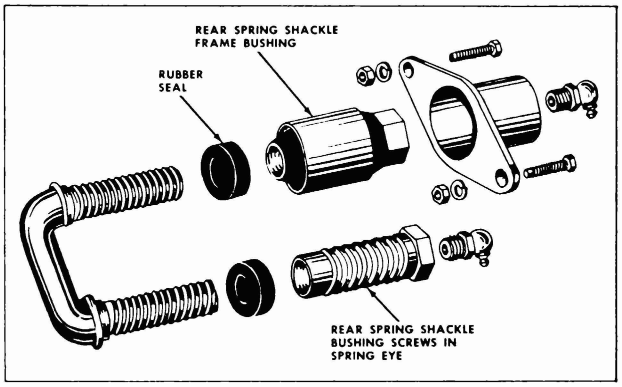

REAR SPRING SHACKLE FRAME BUSHING
RUBBER SEAL
REAR SPRING SHACKLE BUSHING SCREWS IN SPRING EYE

Figure 7—Rear Spring Shackle 41-4260-80, 46-47-4860 Series. (Left Side Shown.)

SHOCK ABSORBERS

Description

All shock absorbers, front and rear, are direct, double acting, telescoping type. The end mountings of the shock absorbers are retained in rubber insulators at both the axle and body sections.

SHOCK ABSORBER INSPECTION

Shock absorbers should be inspected for fluid leaks and for uniform operation. If the shock absorber shows signs of a fluid leak the unit should be replaced.

When the shock absorber is removed from the car for examination, place it in a vise, in approximately the same position as it is mounted in the car. Now work the unit up and down for its full stroke a few times to remove all of the air from the pressure cylinder. After the air has been removed, work the shock absorber up and down slowly, through its full stroke. The shock absorber should move through the full stroke with a constant pressure. If the movement is erratic, that is fast then slow, the shock absorber should be replaced.

Next, hold the shock absorber in the vise in a vertical position and rotate the upper half, or dust shield, between your fingers (Fig. 8). If it does not rotate freely, it indicates that the piston rod is bent and the shock absorber should be replaced.

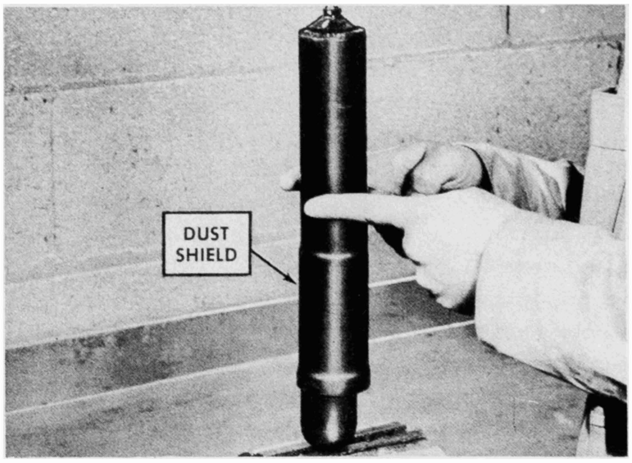


Figure 8—Testing the shock absorber for binding. The dust shield rotates smoothly and freely.

Noisy Shock Absorbers

Before replacing a shock absorber because of any noise, inspect the connections of the shock absorber to the axle and body. The rubber insulator may be damaged or not functioning properly.

INSTALLING REAR SHOCK ABSORBERS

4860 Series

In this series a new type of grommet is used which requires a new tightening procedure. Adjust the retainer so that it may be rotated with very little effort and still be held under tension. Overtightening of the grommet will destroy the resiliency to the extent that a rumbling rattle will be produced.

41-42-46-4760 Series

The adjustment for this series of cars is to tighten the grommet down until it bulges slightly.

Heavy Duty Springs and Shock Absorbers—47-4840-60 Series

Where cars are operated under heavy loads or are operated in extremely rough territory where the driving conditions are severe, heavy duty springs and shock absorbers are available for service. However, we do not recommend the installation of these parts unless the conditions warrant the change.

Rear Shock Absorber Lower Bayonet— 46-47-48 Series

In many cases, replacement shock absorber failures, particularly bayonet breakage, may be attributed to the anchor ball being assembled in the retainer plates in a rigid manner. It is, therefore, important in order to prevent recurrence of this failure that upon installation of a new shock absorber an inspection of the anchor ball assembly be made to determine whether a restricted pivot ball action exists.

Inspect the rubber insulators and replace those that are damaged or have become vulcanized to the anchor ball. Application of rubber lubricant (such as DuPont Orel) around the ball area will facilitate its assembly and prevent adhesion of the mating parts.

> CAUTION: *To install a shock absorber correctly, the lower, stud, end of the shock absorber must be centered in the slot of the upper axle retainer plate. Then fasten the anchor ball assembly securely to the retainer plate. Now as the upper axle retainer plate is fastened to the rear spring to axle seat see that the upper, stud, end of the shock absorber is in line with the mounting hole in the tower or cover.*

On the early '60 series cars, the upper retainer plates are not equipped with the rivet dowel to prevent mislocation. They must be installed with the elongation of the hole toward the wheel to eliminate any possible interference between the bayonet and retainer.

A snug pivot action of the pivot ball must be maintained however, to prevent the pivot ball from being held in a rigid position, it may be necessary in some instances to adjust the ball anchor assembly by inserting a shim between the retainer plates.

On all series except 4860 the upper rubbers should be tightened until they bulge slightly and then securely locked with a pal nut. For 4860 follow procedure on page 8.

Prior to new shock absorber installation, extend them fully several times while in a vertical position to permit escape of air from the operating chamber, as outlined on page 8, Shock Absorber Inspection.

SHOCK ABSORBER SPECIFICATIONS

Year Series	**4140**	**4240**	**4640**	**4740**	**4840**
Make	Delco	Delco	Delco	Delco	Delco
Direct Acting Front and Rear	Yes	Yes	Yes	Yes	Yes
Year Series	**4160**	**4260**	**4660**	**4760**	**4860**
Make	Delco	Delco	Monroe	Monroe	Monroe
Direct Acting Front and Rear	Yes	Yes	Yes	Yes	Yes
Year Series	**4180**	**4280**			
Make	Delco	Delco			
Direct Acting Front and Rear	Yes	Yes			

SPRING SPECIFICATIONS

Year Series	**4140**	**4240**	**4640**	**4740**	**4840**
FRONT SPRING					
Front Spring Type	Coil	Coil	Coil	Coil	Coil
Frt. Coil Spring Free Length	14 1/16″	14 1/16″	15½″	15½″	15½″
Length Under Curb Weight	9 7/16″	9 7/16″	9⅞″	9⅞″	9⅞″
REAR SPRING					
Rear Spring Type	Coil	Coil	Coil	Coil	Coil
Rear Coil Spring Free Length	16 9/16″	16 9/16″	16 9/16″	16 9/16″	16 9/16″
Length Under Curb Weight	9 13/16″	9 13/16″	9 13/16″	9 13/16″	9 13/16″
Torsional Stabilizer	Rear	Rear	Rear	Rear	Rear
Year Series	**4160**	**4260**	**4660**	**4760**	**4860**
FRONT SPRING					
Front Spring Type	Coil	Coil	Coil	Coil	Coil
Frt. Coil Spring Free Length	14 13/16″	14 13/16″	14 13/16″	14 13/16″	14 13/16″
Length Under Curb Weight	9″	9″	9″	9″	9″
REAR SPRING					
Rear Spring Type	Semi-Elliptic	Semi-Elliptic	Semi-Elliptic	Semi-Elliptic	Semi-Elliptic
Rear Spring Length	53⅞″	53⅞″	53½″	53½″	53½″
Rear Spring Width	1¾″	1¾″	1¾″	1¾″	1¾″
Number of Leaves	8	8	8	8	8
Rear Spring Covered	Yes	Yes	Yes	Yes	Yes
Rear Spring Shackles Type	Threaded	Threaded	Threaded	Threaded	Threaded
Torsional Stabilizer	Front	Front	Front	Front	Front
Year Series	**4180**	**4280**			
FRONT SPRING					
Front Spring Type	Coil	Coil			
Front Coil Spring Free Length	15⅜″	15⅜″			
Length Under Curb Weight	9¼″	9¼″			
REAR SPRING					
Rear Spring Type	Semi-Elliptic	Semi-Elliptic			
Rear Spring Length	53⅞″	53⅞″			
Rear Spring Width	1¾″	1¾″			
Number of Leaves	8	8			
Rear Spring Covered	Yes	Yes			
Rear Spring Shackle Type	Threaded	Threaded			
Torsional Stabilizer	Front	Front			

HOOD • FENDERS
WHEEL SHIELDS
RUNNING BOARDS
BUMPERS
SECTION

Nash

TECHNICAL MANUAL

ALIGNMENT OF THE HOOD 2

HOOD-FENDERS-WHEEL SHIELDS-RUNNING BOARDS-BUMPERS SECTION

NASH TECHNICAL MANUAL

ALIGNMENT OF THE HOOD

To Move the Hood Away From or To the Cowl

The hood can be shifted back and forth by loosening the cap screws ½ to 1 turn and tapping the hinges backward or forward the same amount.

To Move the Hood Down Onto the Cowl or Hood Lacing

Loosen the rear cap screw on each lower hood hinge (making sure that the front cap screws are tight) and tap the back of the hood hinge down. This will bring the hood down and back at the same time. Raising the back of the hinge will lift the hood and at the same time move it forward.

> CAUTION: *The rear of the hood should rest on the hood lacing when in a closed position to eliminate hood rattles. This hood lacing should be lubricated with a rubber lubricant.*

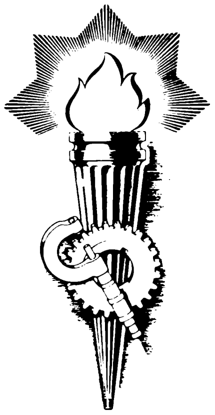
To Move the Side of Hood Away From or To the Side of the Cowl

The rear lower corners of the hood can be made to fit or hug the cowl, by bending the hood support brace and the rear corner of the hood toward the cowl or by bending them away from the cowl if too close.

To Correct Too Large a Gap Between the Hood and Fenders

If the gap between the hood and hoodside on one side is too large, the fender and hoodside on that side should be shifted to meet the contour of the hood. This can be done by loosening the fender and hoodside and shifting them on the clearance in the bolt holes enough to align the hood to the fender opening.

WEATHER EYE
SPEEDOMETER
INSTRUMENT PANEL
SECTION



Nash

TECHNICAL MANUAL

WEATHER EYE 2

WEATHER EYE PARTS BUILT INTO THE BODY 3

WEATHER EYE SUB-ASSEMBLIES 3

INSTALLATION OF THE SUB-ASSEMBLIES 3

COWL VENTILATOR HANDLE LINKAGE 5

WEATHER EYE OPERATION 5

SUMMER DRIVING 5

WINTER DRIVING 6

WINDSHIELD DEFROSTING 6

HEATER AIR DISTRIBUTION 7

SPEEDOMETER 7

INSTRUMENT PANEL 8

WEATHER EYE—SPEEDOMETER INSTRUMENT PANEL SECTION

NASH TECHNICAL MANUAL

WEATHER EYE

Description

The Nash Weather Eye is a revolutionary system of heating and ventilating the car, giving warmth and clear vision in the winter and dustless ventilation in the summer. This unit is located beneath the instrument panel on the cowl and contains one of the largest of heating cores that effectively changes the temperature of the air for comfortable winter driving.

Two large fans are used for defrosting and heating in the winter and for dustfree ventilation in the summer.

The forward motion of the car forces air through the open cowl ventilator. This fresh air passes through a filter that removes dust and dirt, from which it passes into a large heating core. From there, with door "A" closed, Fig. 7, it is defused into the car through a large register just above the toe-board section of the floor. This constant flow of air creates a pressure inside the car body that will expel all stale air and fumes.

This weather eye system is completely automatic, just like a heating and ventilating system in a home. Adjustment of the weather eye control

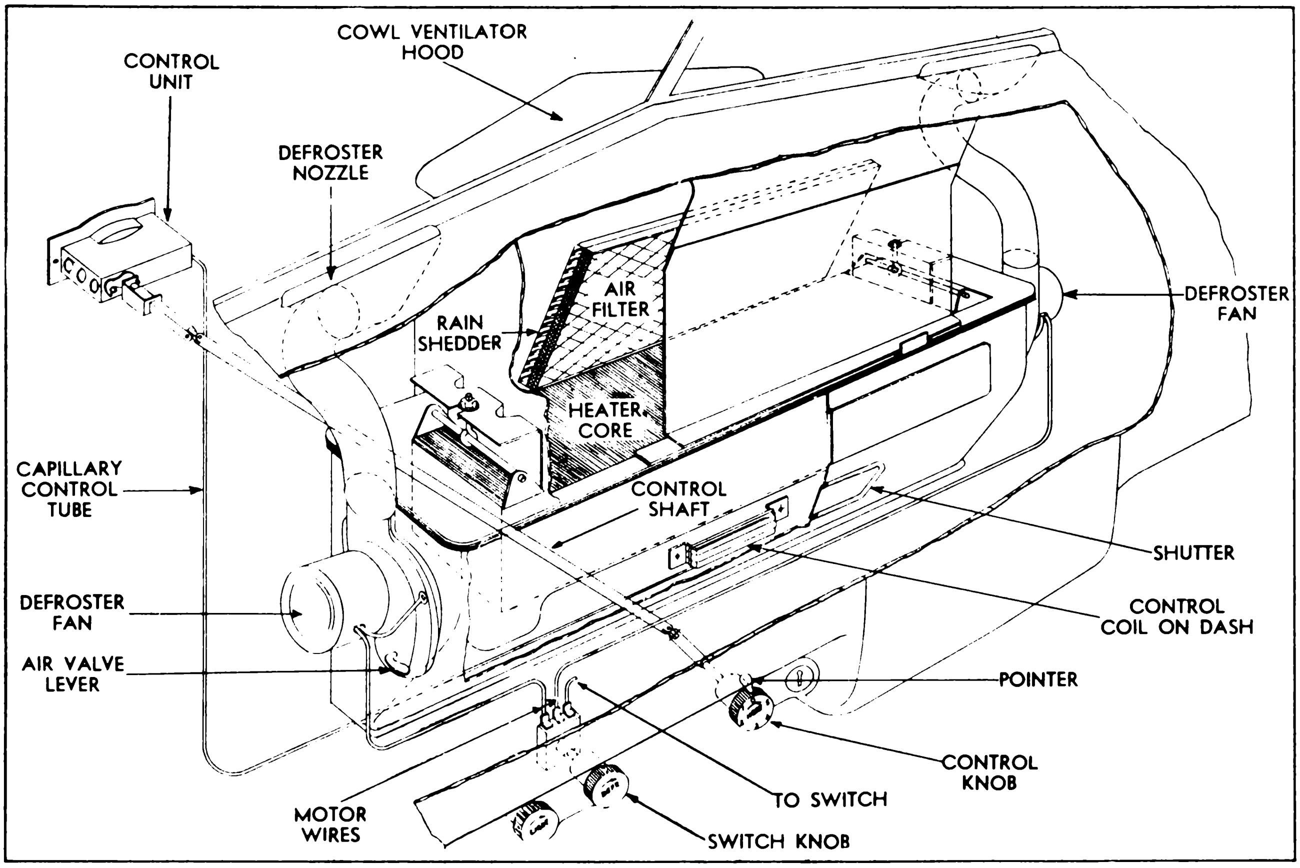

COWL VENTILATOR HOOD
CONTROL UNIT
DEFROSTER NOZZLE
AIR FILTER
RAIN SHEDDER
HEATER CORE
DEFROSTER FAN
CAPILLARY CONTROL TUBE
CONTROL SHAFT
SHUTTER
DEFROSTER FAN
CONTROL COIL ON DASH
AIR VALVE LEVER
POINTER
CONTROL KNOB
TO SWITCH
MOTOR WIRES
SWITCH KNOB

Figure 1—Nash Weather Eye Conditioned Air System.

knob allows the thermostat to operate and maintain this temperature automatically.

Construction—All Series

The Nash Weather Eye as a unit is partially built into the car body, which is completed by the insulation of sub-assemblies supplied as accessories. (See Fig. 1.)

WEATHER EYE PARTS BUILT INTO THE BODY

4240-60-80, 46-47-4840-60 Series

Cowl ventilator hood on the cowl.

Cowl ventilator cover.

Air duct below the cowl.

Water shedder and drain located in the air duct.

Defroster nozzle ahead of the right glove box.

WEATHER EYE SUB-ASSEMBLIES SUPPLIED AS ACCESSORIES

4240-60-80, 46-47-4840-60 Series

Assembled core, shroud and fan with mounting parts.

Air filter for mounting in the water shedder.

Water control valve and thermostat unit.

Control shaft.

Defroster nozzle, left.

Defroster tubes.

Defroster fan operating switch.

Water hoses and nipples with attaching parts.

WEATHER EYE PARTS BUILT INTO THE BODY

4140-60-80 Series

Air intake duct at cowl ventilator.

Water shedder and drain, located in the intake duct.

Defroster nozzle, behind the glove box adjacent to the windshield.

WEATHER EYE SUB-ASSEMBLIES SUPPLIED AS ACCESSORIES

4140-60-80 Series

Assembled shroud, core and fans with mounting parts.

Air filter for mounting in the water shedder.

Balanced water control valve and thermostatic control unit.

Control shaft.

Defroster nozzle for the left side.

Defroster fan operating switch.

Water hose and nipples with attaching parts.

INSTALLING THE ACCESSORY ASSEMBLIES

All Series

The following operations are required to install the accessory assemblies of the weather eye system into a car:

1. The steering column and shifting lever will have to be lowered from the instrument panel. Place the shifting lever aligning pin (J-1390) as outlined on page 2, Fig. 2, of the Shifting System Section.

2. Remove the two nuts holding the steering gear column to the instrument panel. Flex the loosened column sufficiently to place a ¾″ wood block between the bracket and the instrument panel.

CAUTION: *It may be necessary to loosen the steering gear housing at the frame to flex the column down enough to install the block.*

3. Install the left defroster nozzle up above the steering column.

4. Loosen the cowl ventilator hood wing nuts. These nuts are reached from beneath and behind the instrument panel or through the covered opening in the glove box. Remove the cover and grille assembly. (Fig. 2.)

With the ventilator cowl cover open, remove the rubber and metal cover. The rain shedder may be removed by bringing it forward and up, which releases it from its retainers.

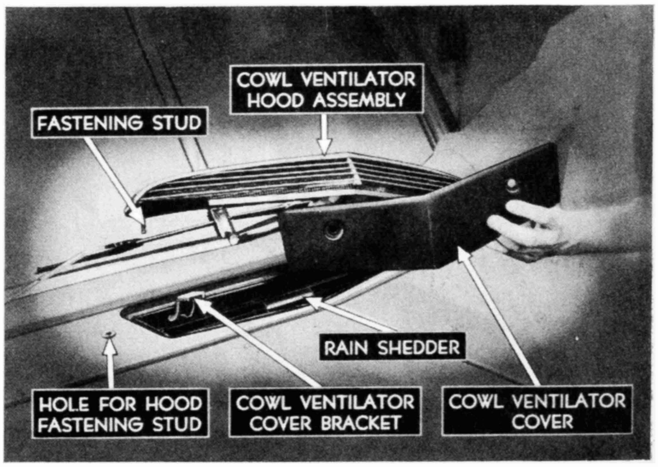

COWL VENTILATOR HOOD ASSEMBLY
FASTENING STUD
RAIN SHEDDER
HOLE FOR HOOD FASTENING STUD
COWL VENTILATOR COVER BRACKET
COWL VENTILATOR COVER

Figure 2—Cowl Ventilator and Shedder—4260-80, 46-47-4840-60 Series.

Now install the air filter unit and reinstall the shedder and the cover.

Spacing strips located in a rain shedder not originally equipped with an air filter are removed when installing the filter. If the air filter is removed from the shedder, spacing strips must be installed to properly locate the shedder in the air duct. The rain shedder must be well down and back in position to function properly.

5. Remove the insulation (per imprint furnished with sub-assemblies) on the upper left side of the dash to permit installation of the thermostatic control unit and flange (Fig. 1). Remove insulation for heater core inlet and outlet. For models without insulation on the front side of the dash, use the felt spacer under the control unit flange, also spacers with the attaching screws.

The flexed steering column provides sufficient clearance for installation of the assembled core, shroud and fan assembly. With the unit in place be sure that the air duct rubber drain tube is properly connected.

6. Loosen the eye bolt clamp nuts of the assembly and engage the bolts in slots provided in the lower flange of the air duct. Tighten the nuts only sufficiently to hold the unit securely.

7. Install the control in the dash with the capillary control tube to the inside and toward the center of the car. (See Fig. 3.)

Use care to avoid sharp kinks or bends in the capillary tubing leading from the control. Rubber and steel insulating covers provided are to be placed over the front side of the mounted control unit to insulate it from the engine compartment temperatures.

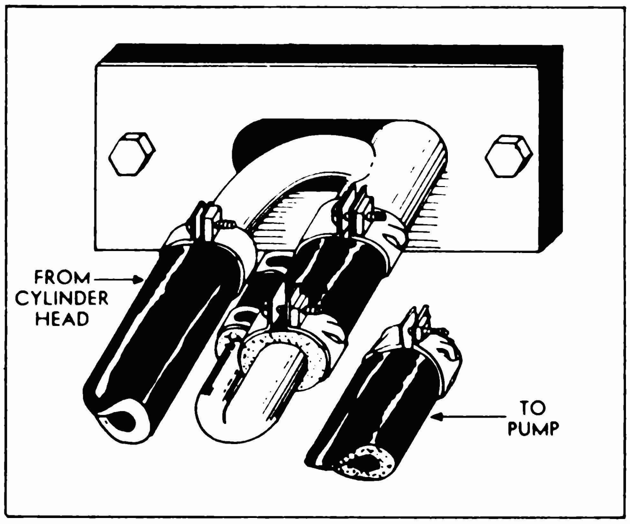


Figure 3—Control Unit Mounted, Engine Side and Hoses.

Dress the capillary tube and coil and line up this tube and coil ahead of the core through the opening in the baffle plate above the core (Fig. 1). Secure the tube coil in the center of the dash so it will be directly in the heater air stream.

Observe hole locations, by imprints furnished with units, in insulation approximately 5⅝" above the front edge of the toe board. Holes 4⅜" apart are pierced through the metal. Do not enlarge the holes as this would make the sheet metal screws supplied unsuitable. (See Fig. 4.)

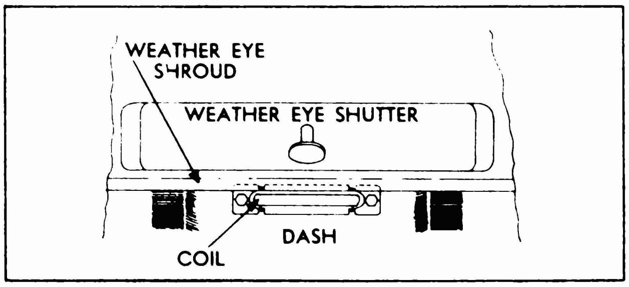


Figure 4—Control Coil on Dash.

Check the capillary tube to be sure its entire length is well away from the air intake duct or other cold surfaces and is free from sharp bends or kinks which would affect weather eye operation.

8. Install the defroster hoses; connect the fan motor wires to the defroster switch. Connect the defroster switch to the ignition switch by means of the connecting wire furnished. (Fig. 1.)

9. Install the manual control shaft, from the control unit to the control knob. (Fig. 1.)

Secure the steering column bracket to the instrument panel and tighten the gear in the frame. Remove shifter pin J-1390 and check shifting.

10. Install the nipples in the cylinder head and water pump body.

11. Install the water hose from the cylinder head nipple to the curved tube of the control unit. (Fig. 3.) Connect the water valve tube (straight) to the upper heater core tube by means of the metal "U" connection. Install the water hose from the lower heater core tube to the water pump. This hose arrangement controls the flow of hot water into the heater. (Refer to Fig. 3.)

Vent the heater core by turning the control shaft its limit to the "on" position being sure the radiator is full, and disconnect the hose from the water valve until the water begins to drain at that point. Retighten the hose connection.

COWL VENTILATOR HANDLE LINKAGE

4140-60-80 Series

The opening and closing of the cowl ventilator cover on the 4100 series cars is controlled by the handle mounted at the bottom of the instrument panel to the left of center. The mechanism of this handle consists of two friction plates, one of which contains a ball bearing plunger under spring tension. The other plate has several recessed ball sockets. By pushing the handle forward from the closed position, the ball bearing plunger will engage the sockets one after another, providing several open positions in which the cowl ventilator cover may be used.

4240-60-80, 46-47-4840-60 Series

The cowl handle linkage consists of two slotted links, one fastened to the ventilator cover shaft, the other to the ventilator handle mechanism. When bolted together, these permit adjustment along their length for proper control of the handle and cover.

SERVICE LOCK LEVER

All Series

A service lock lever (number 3 in Fig. 5) is mounted on the right of the cowl ventilator handle. When this is pulled down, the cowl ventilator handle may be pushed forward beyond the normal operating range, opening the ventilator to the wide open service position. This will permit the installation of a new weather eye filter or the performance of other service or maintenance operations.

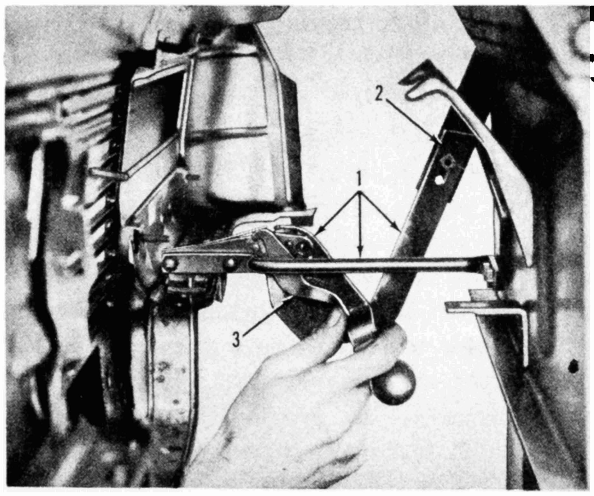


Figure 5—Cowl Handle Assembly on 4100 Series, showing the closing of ventilator cover from service position, and releasing Service Lock Lever.

1. Ventilator Handle Assembly. 2. Linkage Adjusting Bolt. 3. Service Lock Lever.

When closing the cover from the service position, pull down on the ventilator handle and push forward on the service lock lever, as shown in Fig. 5.

In the center of the front edge of the cowl ventilator cover, a small rod extends down through the cowl ventilator opening in the body. This rod engages a drilled stud which is provided with a spring tension washer to avoid excess movement and flutter of the cover at high speeds. When the cover is to be closed from the service position this rod should be reset into the stud. (Fig. 6.)

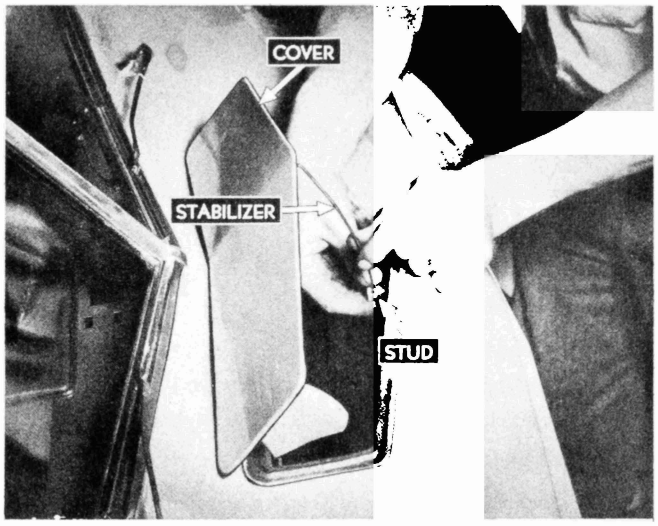


Figure 6—Installing Cowl Ventilator Stabilizer.

WEATHER EYE OPERATION

SUMMER DRIVING

When heat is not required, the control knob "D" (Fig. 7) should be turned to the "off" position. To obtain fresh air while the car is in motion, the cowl vent lever "F" (Fig. 7) should be pushed forward with the door "A" open; this will allow fresh filtered air to circulate within the car.

For slow driving in traffic the defroster fans may be operated at low or full speed to increase the air circulation. This is done by turning the defroster switch "C" to the speed required. The valve "B" (Fig. 7) should be turned down so that as much air as possible will enter the car.

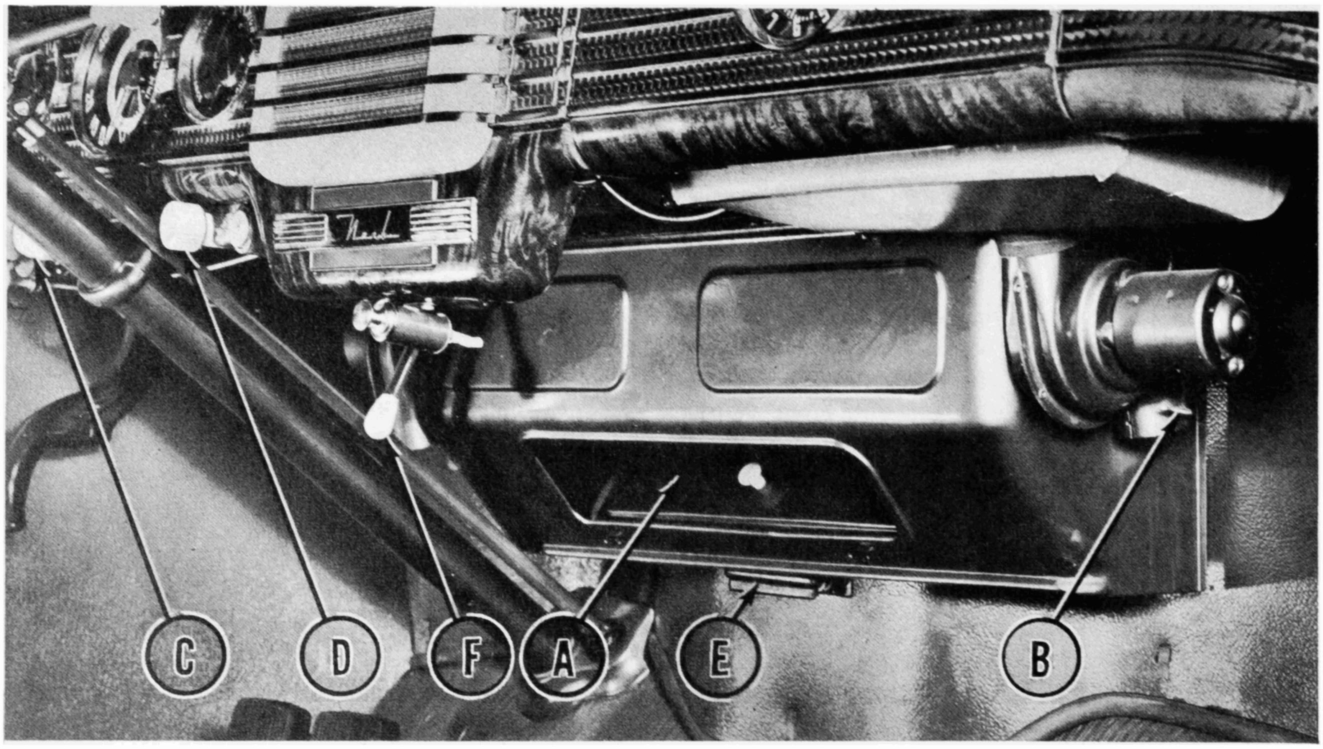


Figure 7—Nash Weather Eye System Installed.

WINTER DRIVING

The weather eye will provide warm air after a short distance of driving—as soon as the engine coolant becomes warm.

Turn the control knob "D" in the direction indicated by the arrow on the knob, with the door "A" closed (Fig. 7) and the cowl vent lever "F" pushed forward. The fresh air will enter and be heated by the heater core and circulate through the car.

Additional heat can be obtained by turning the knob further in the direction of the arrow. This activates the thermostat "E".

For maximum heat turn the control knob "D" all the way open. This will lock the control valve in the wide open position and inactivate the thermostat.

If heat is desired when the car is standing still or moving very slowly, the valve "B" should be turned down and the defroster switch "C" turned on. (Regulate the speed of the fans as required.)

WINDSHIELD DEFROSTING

Windshield defrosting action is conveyed to each side of the windshield by the pressure fans at each end of the weather eye shroud, forcing warm air through the defroster nozzles below the windshield.

Warm air is directed onto the windshields by turning the control knob "D" to the on position and turning the air valves "B" to the horizontal position as shown in Fig. 7. Then turn the defroster switch "C" to the on position.

To promote fast air circulation it is desirable to open a rear quarter ventilator, slightly. See section on Heater Air Distribution.

The cowl ventilator cover "F" can be left open at all times while driving. In cold weather to avoid the initial frosting of the windshield and windows, while the engine is being warmed up, turn the defroster switch on, and open the front door ventilator slightly.

The cowl ventilator need only be closed while the car is being washed. A large volume of water flowing into the ventilator with the cover open will cause water to pass through the rain shedder and on into the car.

HEATING

The satisfactory functioning of the weather eye is dependent on the temperature of the water in the cooling system in the engine. No adjustments or control positions can provide comfortable temperatures in the automobile if the engine is not producing sufficient heat in the circulating water. Refer to page 3 of the Cooling System.

Water temperature is indicated by the indicator in the instrument panel.

In the event air passing through the core is not warm enough to heat the car interior after a period of driving, observe the water heat indicator. If water temperature is not normal, particularly if the radiator is covered, then the engine thermostat should be checked. If the thermostat valve is held open in extreme cold weather, the water temperature will not reach the point required to heat the heater core and the car interior.

HEATER AIR DISTRIBUTION

Heated air flowing from the weather eye is so well distributed with a low velocity that front seat passengers are scarcely aware of the great volume of heated air entering the car body.

The method of forcing fresh filtered air into the car at the open ventilator and through the heating core creates a very slight pressure within the automobile at ordinary speeds. Air in the car is thus constantly being changed and forced out through crevices at doors, foot pedal openings and windows; thus with a slight inside pressure there can be no cold drafts into the car but evenly distributed warm air throughout the car body.

WATER CONTROL VALVE

The water control valve is assembled as a part of the weather eye. (See Fig. 8.)

Water inlet and outlet tubes are to be installed as outlined in the installation instructions.

The water seal used in the assembly is of a special composition to resist oil or solutions that may be used in the cooling system.

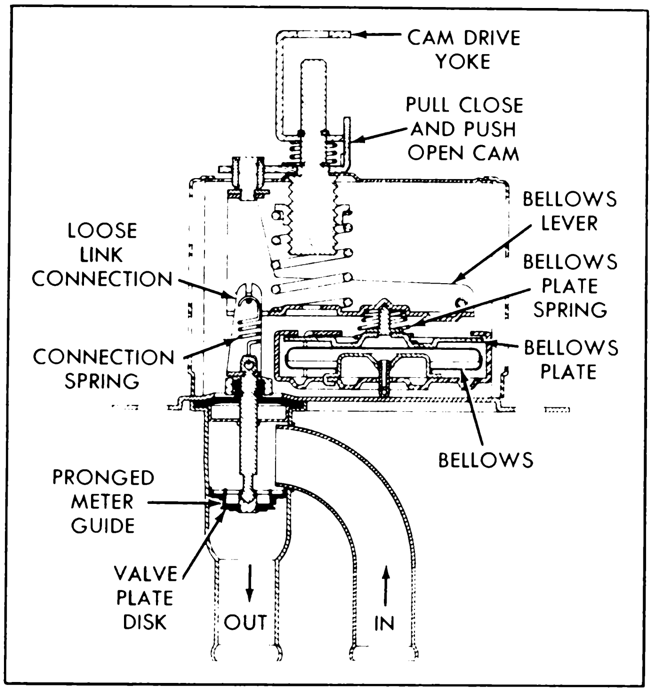


Figure 8—Nash Weather Eye Water Control Valve.

SPEEDOMETER SECTION

SPEEDOMETER DRIVE

The speedometer is driven from a speedometer drive gear on the transmission spline shaft on 40-60-80 series without overdrive, and from a speedometer gear on the overdrive main shaft on those cars with overdrive. This gear drives the speedometer driven gear that is mounted on the speedometer adapter, which is inserted into the transmission or overdrive housing. A flexible cable mounted within a conduit connects the speedometer to the speedometer adapter.

REMOVING SPEEDOMETER DRIVE GEARS

Refer to Fig. 33, page 18, Transmission Section, for transmissions without overdrives. Refer to Fig. 3, page 4 in the Overdrive Section, for the speedometer drive gear in overdrive transmissions.

SPEEDOMETER DRIVE CABLE

This cable can be removed, by removing the speedometer adapter from the transmission or overdrive housing. Then unscrew the knurled nut at the speedometer head. The speedometer drive cable can be pulled out of the conduit from the speedometer end.

If the speedometer cable is broken, look for a sharp kink in the conduit that would cause the cable to break, or a seizure of parts in the speedometer head.

No periodic lubrication is required for speedometer cables, but a very dry cable will be noisy.

LUBRICATION

To lubricate the speedometer cable, first wipe off all of the old grease from the cable. Then as the cable is installed in the conduit, from the speedometer end, grease the lower two-thirds of the cable. Assembling the cable in the conduit in this manner, the lower two-thirds of the cable will properly lubricate the upper one-third of the conduit, thus lubricating the entire cable evenly for proper performance. Lubricating the cable in this manner will prevent over-lubrication and the danger of having grease drop down on the front seat passenger.

Use any good grade of graphite grease. Make sure that the outside of the conduit is clean before connecting the conduit to the speedometer and transmission.

CAUTION: *Make sure that the speedometer cable is inserted into the speedometer head and into the speedometer adapter before tightening the knurled nuts of the conduit.*

Speedometers used on 46-47-4840-60 Series cars have an oiler provided on the back of the speedometer head, which can be reoiled with S.A.E. No. 10W oil.

INSTRUMENT PANEL SECTION

INSTRUMENT PANEL

Description

The instrument panel is welded at its outer ends to the front body pillars and spot welded, on the 4140-60-80 series to the cowl panel along the bottom edge of the windshield opening. On the 4240-60-80, 46-47-4840-60 series, the instrument panel is fastened to the cowl panel by sheet metal screws, which in turn is welded to the bottom edge of the windshield opening.

All instruments are held to the back side of the instrument by holding brackets and can easily be removed by removing the bracket screws.

BODY SECTION

Nash

TECHNICAL MANUAL

DESCRIPTION 2

BODY NUMBERS 2

DOORS, ALIGNMENT, ADJUSTMENT 3

REAR DECK COVER ALIGNMENT AND ADJUSTMENT 7

REMOVING WINDOW REGULATORS 9

DOOR WEATHER STRIP 10

REMOVING AND REPLACING THE WINDSHIELD 11

WATER LEAKS 12

APPEARANCE 12

MAJOR BODY REPAIR SECTION 15

BODY ALIGNMENT 15

REPAIRING BODY DAMAGE 16

MEASURING BODY FOR ALIGNMENT 19

INSTALLING NEW PANELS 22

BODY SEALING 22

BODY LUBRICATION CHART 24

NASH PASSENGER CAR MODEL CHART 25

BODY SECTION
NASH TECHNICAL MANUAL

Description

The same principle of body construction has been used in the designing of all Nash cars since 1941.

The four door sedan models are produced in two body types and are known as TRUNK MODELS and the SLIPSTREAM or Fast Back Models.

In the planning of Nash bodies the engineers have designed a body that permits the easy replacement of any section or part of a section.

41-42-46-47-4840 Series

The design of the bodies used on these series is known as the "Unitized" construction in which the box-section upper structure, the box-section pillars, and the strong frame and floor section are all welded together. This forms a single, one piece, all steel unit, adding the strength of the frame to that of the entire body.

41-4260-80, 46-47-4860 Series

The design of the bodies used in these series is the same as that of the 40 series, except for that part of the body frame extending beyond the dash and the chassis, having a frame made up of a deep "U" and box type channel. Refer to Page 2 of the Frame Section.

SERIAL NUMBER

41-42-46-47-4840 Series

This number is stamped on a plate that is riveted to the top of the dash to sill brace, on the right side of the engine under the hood.

41-4260-80, 46-47-4860 Series

This number is stamped on a plate that is riveted to the top of the frame on the right side of the engine under the hood.

These numbers are assigned in numerical sequence to all cars and are used by the factory to schedule the building of cars. All records pertaining to the car are filed by this number at the manufacturing plants, Parts and Service Departments and in the Zone Offices.

Service Serial Number
41-4240-60-80, 4640-60 Series

This number was stamped on a plate that is riveted to the left front body pillar—visible when the door is open. This number was assigned to cars as they left the production line and served as a record of the various parts that was used in the assembly of the car. This number is important, and should be used in obtaining service parts. It is the number referred to in the Master Parts List showing part changes with reference to service serial number.

Model, Body, Paint, and Trim Numbers

These numbers are stamped on a plate that is riveted to the right side of the cowl above the hood hinge and are visible when the hood is raised. (Fig. 1.)

Model Number

The model number represents the body type. Refer to Page 25 for the numbers of various body types.

Body Number

This number is assigned to the body in numerical sequence for each model and serves as a record for parts that are used in the body. This number is, therefore, not complete unless the model number is used as a prefix—for example 4648-20010.

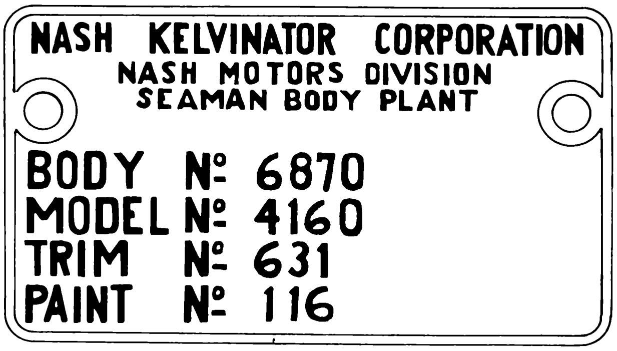


Figure 1—Body Number Plate.

Trim and Paint Number

The trim and paint number will be found on the same plate as the model and body number. (See Fig. 1.)

When ordering trim material, a sample of the upholstery is of great assistance in order to match the color and shade exactly.

When ordering paint, it is important that the color name of the paint be given. Some cars are painted two-tone, and unless the color name is given it is impossible for the supply source to know which of the two colors is required.

All reports and correspondence must bear the body number, model number, serial number and the service serial number, as well as the body, paint, and trim numbers.

MINOR BODY REPAIR SECTION

DOORS

Door Alignment

The proper alignment of a door in the door opening is maintained by the correct setting of the door hinges. The door hinge pillar is an exact duplicate in contour of the body hinge pillar. Setting the hinges correctly will provide uniform clearance from top to bottom between the body hinge pillar and the door hinge pillar. With this alignment established the top, bottom, and lock side of the door should also have a uniform clearance with the main roof rail, floor sill, and the center pillar.

Tapped plates are encased in the body hinge pillars to permit moving the hinges up or down, in or out.

The upper hinge shaft on the front doors, and both hinge shafts on the rear doors, extend through the door hinge pillar and are bolted to the door inner panel under the trim panel. (Fig. 2.)

The bolt holes in the door inner panel are elongated for adjustment of the door on the hinges.

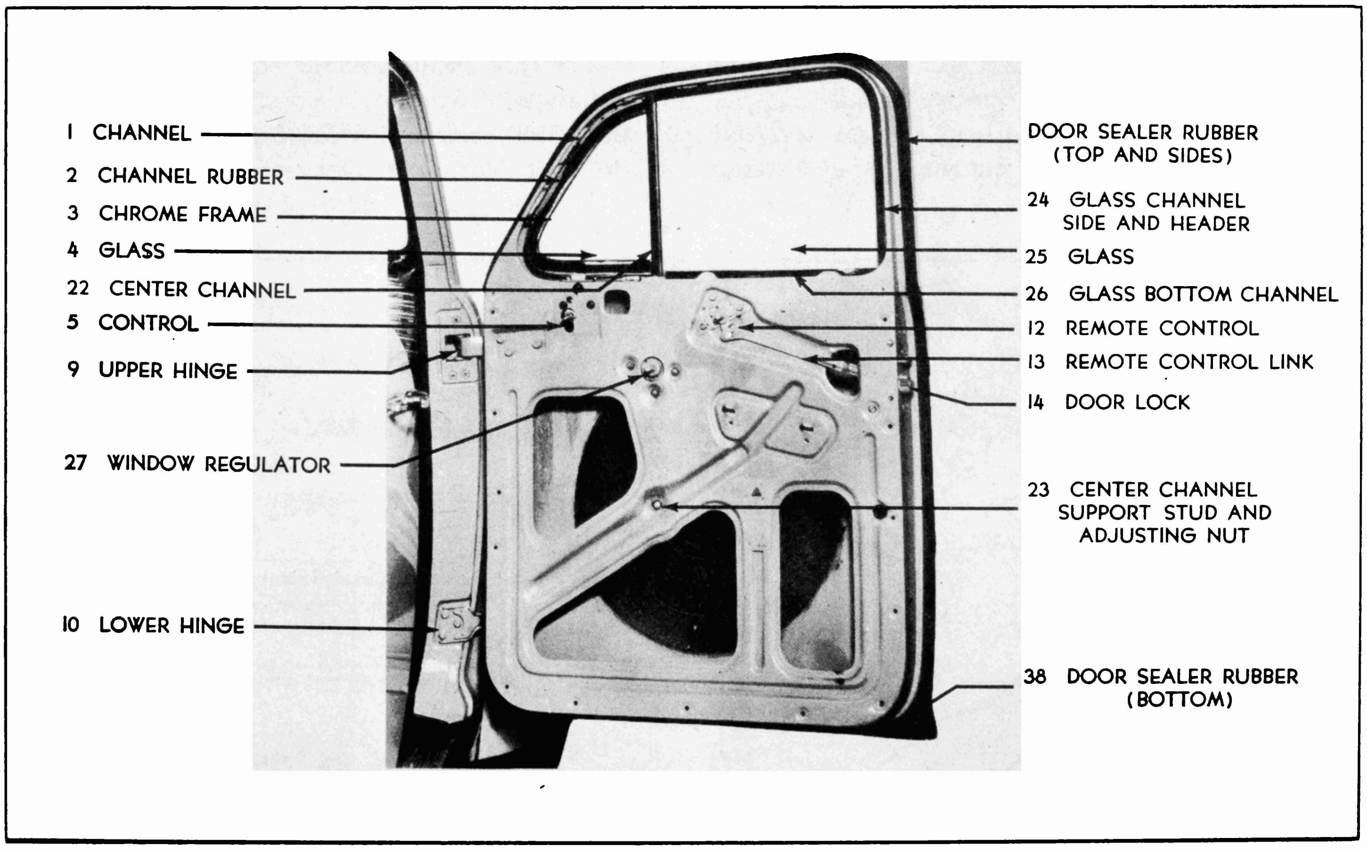

1 CHANNEL
2 CHANNEL RUBBER
3 CHROME FRAME
4 GLASS
22 CENTER CHANNEL
5 CONTROL
9 UPPER HINGE
27 WINDOW REGULATOR
10 LOWER HINGE
DOOR SEALER RUBBER (TOP AND SIDES)
24 GLASS CHANNEL SIDE AND HEADER
25 GLASS
26 GLASS BOTTOM CHANNEL
12 REMOTE CONTROL
13 REMOTE CONTROL LINK
14 DOOR LOCK
23 CENTER CHANNEL SUPPORT STUD AND ADJUSTING NUT
38 DOOR SEALER RUBBER (BOTTOM)

Figure 2—Right Front Door—Parts Assembled.

This adjustment permits moving the door to the front or rear and up or down in the opening.

The front door lower hinge is screwed to the face of the body pillar. To move the door toward the center body pillar, it is necessary to shim behind this hinge at the body pillar. (There is no adjustment of this hinge on the door post.)

To move the front or rear doors up or down, loosen hinge to body pillar screws, raise the door and hinges and tighten hinges. (NOTE: One screw at the base of hinge is visible only when door is in full open position.)

Door Hinge Adjustment

To move the front door toward center body pillar—

Remove door trim panel. Refer to Page 8.

Loosen upper hinge to door inner panel screws.

Loosen lower hinge to front body pillar screws.

Move door to required distance—tighten upper hinge screws.

Insert shim between lower hinge and front body pillar. (Use glass setting tape as shim.)

To move rear door toward center body pillar—

Remove trim panel.

Loosen hinge to door inner panel screws.

Move door the desired distance.

Tighten the hinges.

To move the front or rear doors in or out on the body so the outer door panel will be flush or even with the cowl side or rear quarter panel—

Loosen the hinges at the front or rear body pillars, move the door in or out the desired distance, tighten the hinges.

CAUTION: *All hinges are of very heavy construction and no attempt should be made to bend them under any circumstances. To do so will result in damage to the door and body pillars.*

Door Lock Striker and Dovetail Adjustment

The combination door lock striker and dovetail is fastened to the center body pillar by four machine screws. These screws are set into a movable, tapped plate inside the body pillar which permits adjustment for alignment of the door.

The lock striker and dovetail should be set on the center pillars so the dovetail of the door lock will rest lightly on it. The lock striker must be set low enough that the movable catch will contact the lock rotor causing it to revolve when the door is being opened.

THIS WILL ELIMINATE THE ROTOR BEING STUCK ON DEAD CENTER AND ALLOW THE LOCK TO CATCH WHEN THE DOOR IS CLOSED.

In cases where the striker plate has been moved in as far as possible, and the door sealer rubber is not tight against the body, it is then necessary to remove the striker plate and ream the inner edge of the holes in the pillar.

The lock striker and dovetail should also extend far enough from the center pillar to permit at least 50% bearing surface for the male dovetail of the lock. To obtain this setting, shim back of the lock striker using shim obtained from the Nash

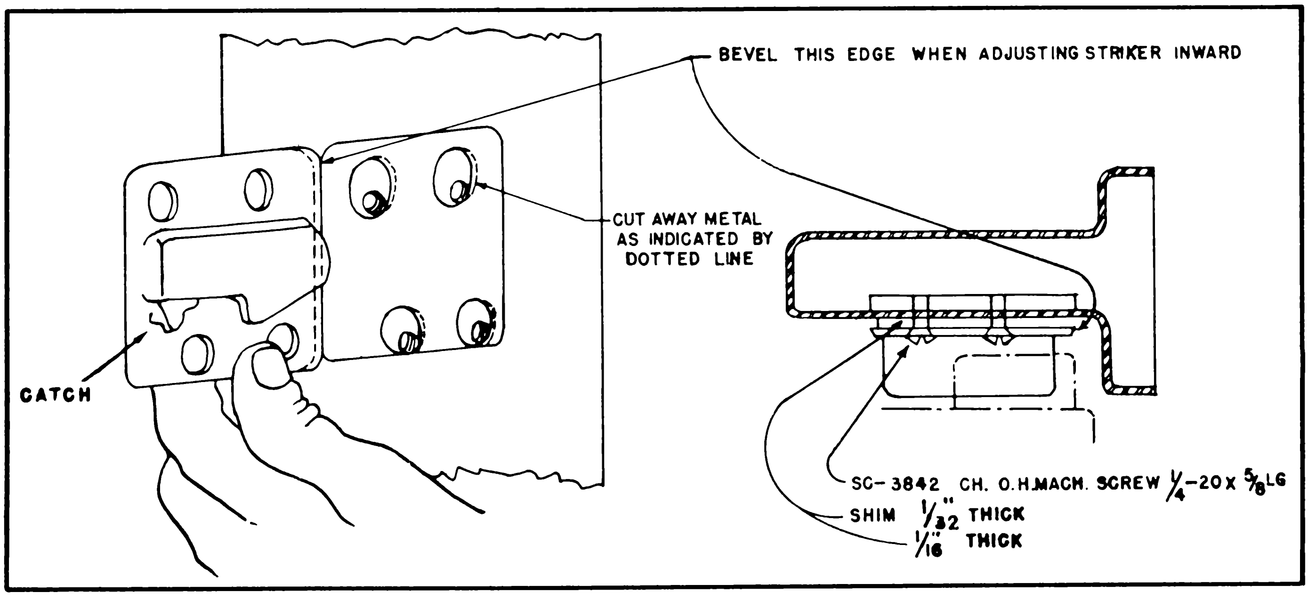

BEVEL THIS EDGE WHEN ADJUSTING STRIKER INWARD
CUT AWAY METAL AS INDICATED BY DOTTED LINE
CATCH
SC-3842 CH. O.H.MACH. SCREW $\frac{1}{4}$-20 X $\frac{5}{8}$ LG
SHIM $\frac{1}{32}$" THICK
$\frac{1}{16}$" THICK

Figure 3—Striker Plate Adjustment

Parts Department which is 1/32″ or 1/16″ thick. (Fig. 3.)

Door locks must be kept well oiled. Oil holes are provided in the face of the door pillar for lubricating the handle mechanism, cams and rotor shaft.

> CAUTION: *The door lock will not catch on the dovetail to hold the door closed if the outside handle is depressed while the door is being closed.*

Removing Door Remote Control Handle and Window Regulator Handle

Remote control handles are set at uniform angles on all doors. The window regulator handles are set pointing down when the windows are in the closed position. Press in on the escutcheon plate against the trim panel. This will allow the lock pin in the shaft to be pushed out so the handle can be removed.

Installation Procedure

1. Install the escutcheon on the shaft.
2. Install the handle in the proper position with the pin inserted in the top half of the handle hole.
3. Press in against the escutcheon, at the same time driving the handle into proper position with the end of a hammer handle until the pin can be tapped into the hole in the shaft. If the pin is in its correct position the escutcheon will slip into place.

Removing Ventilator Handle

Use door handle Tool Set B-203 N. Insert the depressing tool between the handle and the escutcheon plate, prying out until the slot in the handle is exposed. Hold your thumb over the top of the handle to prevent the retaining spring from springing away when released.

With the retaining spring removing tool B-133-A inserted in the slot of the handle, lift the retaining spring up, releasing the handle from the shaft so that it may be removed from the door.

Installing the Ventilator Handle

With the retaining spring loading tool B-202, place the spring properly in the handle.

Install the escutcheon and handle on the shaft, pushing the handle in until the retaining spring engages the slot in the shaft.

Removing the Door Outside Handle

Turn the door handle to a vertical position. This allows the two screws that hold the escutcheon plate to be removed. Remove the screws and the door handle.

Removing Door Lock Cylinder

The door lock cylinder has a groove on the top and bottom sides through which a retaining spring is inserted. This spring holds the lock against the door outer panel.

An opening is provided in the door lock pillar through which the cylinder lock retaining spring is installed. This opening is concealed by the rubber door seal.

To remove the door lock cylinder the door has to be open, with the key in the lock. Carefully loosen the rubber door seal from the door, beside the door lock. This will expose the door lock retaining spring.

With a screw driver, press the retaining spring in against the door and at the same time pry out on the spring until it is out about 1″. In this position the spring will release the cylinder lock so that it can be removed from the door.

Installing a Door Cylinder Lock

Before installing the cylinder lock be sure that the remote control and the cylinder lock are unlocked. Insert a long needle through the trim panel and the hole in the door to serve as a guide for entering the lock shaft into the proper hole in the locking mechanism. Hold the lock cylinder tight against the door panel and drive the retaining spring in, locking the cylinder in position.

Use rubber cement to reset the rubber door seal. *Caution*: Do not close the door until the rubber door seal cement has set.

DOOR CHECKS—DOOR HINGE SPRINGS

4140-60-80 Series Cars

The door checks on the 4100 series cars are of a link and bracket type that is bolted to the front body pillar with the link extending through the door pillar. An adjusting nut is provided to limit the opening of the door.

4240-60-80, 46-47-4840-60 Series Cars

A change in design of the door hinges was made on these series by adding two "W" shaped springs in the front door upper and one spring in the rear door lower hinge. This provides a door check for these doors.

The front door upper hinge with the two springs operates as follows:

> One spring serves as a door check limiting the travel of the door to the full open position and serves as a stop to help prevent the door from closing while in this position.
>
> One spring serves as a brake or check to hold the door in the half open position. At the same time it adds spring tension to assist in closing the door from the half open position.

The one spring in the lower hinge of the rear doors holds the door at the full open position.

Spring Replacements

In cases where the door hinge springs are broken or require replacement, a replacement spring has been provided to be used instead of replacing the complete hinge. (Fig. 4.)

There are two springs, right and lefts. The right spring is used in the right front door upper hinge and the right rear door lower hinge.

The left spring is used in the left front door upper hinge and in the left door lower hinge.

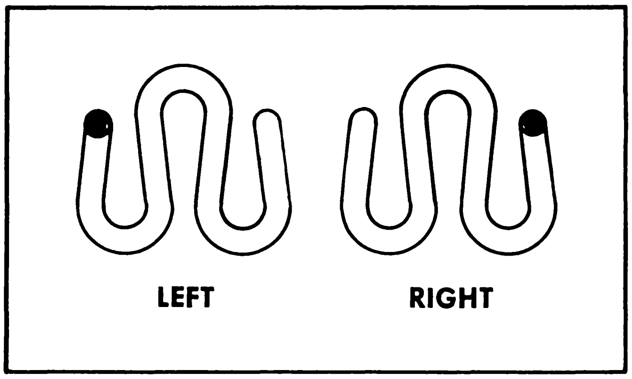


Figure 4—Front Door Hinges Spring.

To Remove and Replace Springs in Door Hinges without Removing Hinge from the Door

CAUTION: *Protect the paint by using a strip of masking tape on the edge of the door, on the hinge side, from above the upper hinge to below the lower hinge, and also on the edge of the hinge body pillar.*

1. Use a scratch awl to mark around the upper hinge and the lower hinge, so as to have the proper alignment. Then remove the door and hinge from the body hinge pillar.
2. Place the door on a cloth on the floor, and straddle the door so as to have the bottom side of the hinge to the right.
3. Drive out the pin and free the hinge to expose half of the spring from the hinge shaft.
4. Use a screw driver to pry the prong of the lower spring out of the slot of the hinge box.
5. Use a crescent wrench to turn the hinge toward closed position, just enough to hold the spring prong out of the slot.
6. Tap the top of hinge box with a hammer, so as to drive off the spring prong. Keep the hinge free as possible.
7. Insert a screw driver next to the prong that is still in the hinge shaft, and hold the spring tight against the screw driver. Then pry the spring out of the shaft.

Installation Procedure

1. Put the top spring in first. Then the bottom spring.
2. Use a plier to insert the spring prong into the shaft.
3. Lubricate the pin and replace it.
4. Use a screw driver to pry the prong clear of the box. At the same time open the hinge. The spring will now slide into the slot.
5. Install the door, and line up the hinges with the scribe marks for proper door alignment.

REAR DECK COVER HINGES

41-4240-60-80, 46-47-4840-60 Series

There are two types of trunk cover hinges used on these series cars.

The slipstream models have a concealed interior hinge.

The trunk type and rear deck type models have a chrome plated exterior type hinge.

Interior Hinge Slipstream Models

This hinge is constructed of a heavy channel type steel and is provided with a hinge pin that requires lubrication (Fig. 5). The hinges can be adjusted either at the deck cover or the body for moving the deck cover up, down or sideways in the opening. The adjustment of the screws in this hinge to the body requires a box socket wrench for loosening the lock nuts and a screw driver for loosening or tightening the set screw.

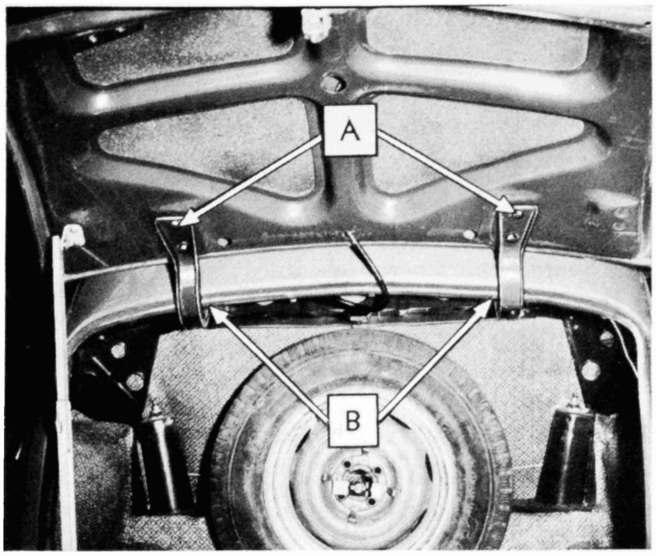


Figure 5—Rear Deck Cover and Hinges.

Exterior Hinge on (Trunk) and (Rear Deck) Type Models

This hinge is finished in chrome on all models with the exception of some 4200 series cars built during the war after restrictions were placed on chrome plated parts. These hinges were then painted the same color as the car.

Removing Exterior Hinges

Lifting the trunk cover, remove the four cap screws from each hinge, and remove the hinges. The threaded boss for each cap screw on the hinge serves as a guide for the hinge in the body and trunk cover. The holes in the body and cover are larger than the boss so the cover can be shifted to align it in the body opening.

Trunk Cover Alignment

Trunk covers may be shifted on hinges to properly align the cover in the opening. Holes provided for hinges on both cover and body are larger than the boss of hinge in which fastening screws are inserted.

To Shift Trunk Cover

1. Raise trunk cover and loosen four screws which hold each trunk hinge to cover. Shift cover to proper side and have someone tighten screws.
2. If alignment is not sufficient, perform same operation to hinge sections on body.
3. In abnormal cases, it may be necessary to increase size of holes for hinges, which can be done with a round file, filing to the side the cover is to be shifted.

Deck Cover Alignment—With Interior Hinges

Deck covers may be shifted on hinges to raise or lower the cover for proper alignment in body opening.

1. To raise or lower the cover, loosen screws (A) Fig. 5 which hold cover to each trunk hinge, shift the cover as desired, and tighten screws.
2. To adjust the deck cover so that it will close tighter on the rubber weatherstrip along the top edge loosen four lock nuts (B) Fig. 5 which hold the hinges to the body as shown, shifting the hinges down for a closer seal against the rubber weatherstrip, or raising the hinges if they close too tightly on the rubber weatherstrip.
3. In abnormal cases, it may be necessary to increase the size of the holes in the hinges, which can be done with a round file, filing to side or end of present holes to which the cover is to be shifted.
4. To adjust the deck cover so that it will fit tighter on the rubber weatherstrip along the bottom, loosen the screws that hold the lock striker to the body.

Turn the outside handle to a half locked position and lower the cover to a partly closed position. This will move the striker so that the lock bolt will engage with the box section of the striker.

With the striker in this position, move it forward or backward until the cover firmly contacts the rubber seal. Then tighten the striker hold down bolts.

REAR DECK COVER LOCK

Rear Deck Lock 41-4240-60-80 Series

On the first 4100 series cars the rear deck lock was a dual locking type design.

On the 4200 series the rear deck lock and the lock striker plate was changed to provide a more positive locking feature. When the deck cover is closed and the handle turned to a locked position, it serves as a locking feature as well as a dovetail, eliminating excessive side movement of the deck cover in the opening.

The 4100 series first type lock was discontinued and a special package was made up for service which included the 4200 series lock with two lock striker plates. The striker plates were of the same design but the spacing of the holes for fastening to the body were different so one plate could be used with this lock as a replacement for the first type and the other plate could be used for this lock for replacement of the second type. This package can, therefore, be used as a replacement part for all 4100 anad 4200 series cars.

Rear Deck Lock 46-47-4840-60 Series

This series deck lock is similar in design to the 4100 and 4200 series lock. However, the following changes have been made:

The hole for the handle shaft is smaller.

The locking plate required for the 4200 series handle has been removed.

A double coil spring has been installed in connection with the lock catch.

Therefore, the 4200 series lock cannot be used with the 46-47-4840-60 series handle or the 46-47-4840-60 series lock cannot be used in the 4100 and 4200 series cars without changing the deck cover handle.

REAR DECK LOCKING TYPE HANDLE

41-4240-60-80 Series Cars

The locking type handle used in these series cars is set into the deck cover through a chrome plated rubber insulated ferrule. The handle shaft extends through the deck cover lock and fastens by the use of a nut and washer which permits removing the handle only by loosening this nut from the inside of the cover.

The handle is so designed that the key cylinder is extended through the handle and shaft so that the turning of the key operates a plunger at the end of the shaft into a plate riveted to the lock.

This handle when locked by the key in a locked position remains in a stationary position and the keys can be removed from the handle. The keys cannot be removed from the handle when in an unlocked position.

This deck handle was changed in design to eliminate damage to the deck cover and lock when forced. The 41-4240-60-80 handle has a sheer groove in the shaft. If excessive strain is placed on the handle the sheer groove will break out and allow the handle to turn free. This is a protection against damage imposed on the deck cover or lock, and requires replacement of the handle only.

46-47-4840-60 Series Cars

This handle is provided with an escutcheon plate that is fastened to the outside surface of the cover with two machine screws.

The handle shaft being drilled and tapped in the end is held secure to the lock by a machine screw and washer, which permits removing the handle after loosening this screw from the inside of the cover.

The keys may be removed when the handle is either locked or unlocked.

When the handle is locked the handle will free wheel, eliminating the possible attempts at theft that were experienced previously.

THIS HANDLE CANNOT BE USED ON PREVIOUS MODELS WITHOUT USING 46-47-4800 SERIES COVER LOCK.

Removing Door Finish Moulding—All Series

Run the window all the way down and remove the screws from the finish moulding. Pull the moulding away from the door at the top. Push the moulding up which will allow it to become free at the bottom, then remove.

CAUTION: *When installing the door finish moulding on front doors, lift the lip of the ventilator rubber weatherstrip up over the top of the finish moulding before tightening the moulding screws. Use a pointed wood wedge for this operation, as a screw driver will damage the finish on the moulding.*

Open the ventilator and check the clearance between the ventilator and the finish moulding and adjust the moulding if the ventilator interferes.

Removing Door Trim Panel

Remove the finish moulding, as outlined above. Then remove the remote control and window regulators. (Refer to Page 9.)

Remove the ventilator handle and the arm rest on front doors.

Using body tool B-201 Handle Depressor, lift the fasteners from the inner door panel. This will eliminate any damage to the fasteners or the trim panel.

CAUTION: *Care should be used when installing the trim panel to see that the clips line up with holes in the door metal panel. PRESS THE CLIPS IN! DO NOT HAMMER THEM INTO PLACE.*

Window Regulators

There are three types of regulators used:

1. Single arm type used on sedan front doors.
2. Double arm type used on sedan rear doors and coach rear quarter windows.
3. Parallel arm type used on coach and coupe doors.

41-4240-60-80 Series

On these series the regulator shaft was provided with cross holes for attaching the handle.

46-47-4840-60 Series

On these series and on all replacement parts for all series, the window regulator shaft has only one hole in it.

In cases of a shaft breaking, it is not necessary to replace the complete regulator. Replace the shaft only.

Replacing Shaft in Single Arm Type Regulator

Turn the regulator gears so that the rivets can be removed and punch out the three rivets. Replace with a new regulator shaft and re-rivet the flange to the regulator. Replace the trim parts.

Replacing Shaft in Double Arm Type Regulator

Remove the trim parts as outlined above. Then turn the gears with the regulator handle to one side as far as possible. Mark the tooth in the large gear that obstructs the lower rivet; then turn the gears to the other side as far as possible and mark the tooth in the large gear that obstructs the lower rivet.

The teeth in the gear that have been marked can now be removed by a grinding wheel or file, which will provide clearance for removing and installing the lower two rivets.

Replacing Shaft in Parallel Arm Type Regulator

Remove the trim parts as outlined above. Then loosen the lock nut on the adjustment bolt. Slide the arms on the regulator body so clearance will be provided for the removal and installation of the two lower rivets. (This lock bolt can be reset when the regulator is re-installed in the door.)

To install the regulator shaft, raise the door glass to its closed position. Then install the new shaft and rivet into position. Align the glass in the side channels and tighten the nut on the lock bolt.

NOTE: *Use Lubri-plate, or hard grease, on the glass bottom channel and window regulator arms and gears. Use flaked or powdered graphite in the felt lined glass slide channels at the side of the glass. To keep the graphite from smearing the side channel mix it with liquid soap and brush it into the channel.*

Removing Window Regulator—All Series

Remove the finish moulding, remote control handle and window regulator handle. On front door remove the ventilator handle and armrest, then remove the door trim panel.

Sedan Front Door

Raise the door glass and remove the screws from the regulator unit holding the glass up through the cutout in the door panel. Disengage the regulator arm from the glass bottom channel, and push the glass up enough to clear the movement of the regulator arm. Now remove the glass through the cutout in the door inner panel.

In replacing regulators, be sure that the regulator arm is set in the up position before installing in the door.

Coupe or Brougham

On these models remove the center glass channel and place the door glass in its lowered position. Then shift the glass toward the front of the door, disengaging the regulator arms from the glass bottom channel.

Remove the screws holding the regulator to the door inner panel and remove the regulator from the door.

To replace the regulator, reverse the procedure, then align the glass to close evenly at the top of the door. This is done by loosening the regulator adjusting nut located below the regulator handle shaft. Raise the glass up into the header channel and tighten the adjusting nut.

Sedan Rear Door

Raise the glass to the top and remove the screws that hold the regulator to the door. Now push the regulator in and turn the handle until the regulator arms disengage from the bottom of the glass channel. Caution: the glass should be held in the up position until the regulator is removed from the door. Then lower the glass with care.

When replacing the regulator, install the regulator arms in the bottom glass channel, holding the glass in the up position by placing a wooden block under the glass, the block supported in one of the openings in the inner door panel.

FRONT DOOR VENTILATOR ASSEMBLY

Removing Ventilator Control

Remove the finish moulding, ventilator handle and the trim panel. (Hinge side only.) Remove the two screws on top that hold the ventilator channel to the ventilator control. Then remove the screw that holds the ventilator glass frame shaft to the ventilator control. Next remove the two screws on the inner door panel that hold the ventilator control to the panel and lower the control until it is disengaged from the glass frame shaft. Then remove from the door.

Removing the Glass Ventilator Frame and Channel

After the ventilator control has been removed, remove the five screws that hold the ventilator channel to the door and open the ventilator about one inch. Now, pull the top of the ventilator channel in toward the inside of the body and lift the complete unit up and out of the door opening.

Removing the Glass Ventilator Frame from the Channel

After the ventilator assembly has been removed from the door, spring the top of the ventilator channel enough to release the upper pivot from the frame. Now lift the frame and glass enough to disengage the lower pivot from the slot in the ventilator channel and rubber sealer.

Removing the Glass from the Chrome Frame

Clamp the bottom pivot in a vise and spread the top and bottom of the frame away from the glass.

Use a "C" clamp as a handle to pull the glass from the frame. This is done by placing a small flat block of wood on each side of the glass and clamping the "C" clamp to them.

NOTE: *The above operation may be done on the car without removing the assembly from the car door.*

Ventilator Glass Frame Adjustments

Excessive play in the glass frame, or a stiff operating handle, is adjusted by an adjusting screw located above the control shaft on the inner door panel. Turning the screw in will increase the tension on the control handle.

Excessive play in the glass frame may be a loose glass frame shaft in the control unit. If tightening the adjusting screw does not correct the looseness remove the control unit and slot the box section at each end of the control unit, with a hack saw. This will allow the box section of the control unit to fit snugly on both sides of the glass frame shaft when the frame shaft to control screw is tightened.

Too large an opening between the glass frame and the ventilator channel may be corrected by inserting a flat washer between the ventilator channel brackets and the door. As there are five brackets, shim under the one nearest the opening.

To straighten the ventilator unit in the door, remove the screws that hold the channel to the door, loosen the screws that hold the control unit to the door and shift the control unit to straighten the ventilator. Tighten all screws after the ventilator is aligned.

Removing the Ventilator Center Glass Channel

Follow the same procedure as outlined for removing the Window Regulator All Series, Page 9. Then remove the screws that hold the glass center channel to the door header, also the screws that hold the glass channel to the top of the door inner panel. Remove the glass channel support stud and the adjusting nut and lift the center channel from the door.

Adjustment

If the glass binds in the channel on either side, adjust the center channel support stud in or out, so that the glass will travel straight up and down. This support stud will be found below the window regulator handle on the inner door panel. An elongated hole has been provided in the inner door panel, so that the center channel may be adjusted for correct alignment with the glass. See that the adjusting lock nut is tightened securely after the adjustment is made.

Door Weatherstrip

The door rubber weatherstrip is of a sponge rubber texture provided with a skin over the complete exterior. Its purpose is to seal around the door and to grip the body center pillar, hinge pillar and all points of intended contact to the body.

It is necessary in service not only to keep the rubber weatherstrip and the area of the body which it contacts clean, but to treat the rubber weatherstrip so that it will maintain its resiliency and thereby avoid the movement of the doors and the noise which results from such movement. To retain this resiliency the service procedure should be as follows:

1. Use a cloth dampened with gasoline to clean all dirt from the rubber weatherstrips, the body pillars, and all other points where the rubber weatherstrip contacts the body.

2. Apply a rubber softener solution such as, or similar to, DuPont's product known as "Orel". (Only to the rubber weatherstrip on the doors.) In some cases where the rubber is dry, a second application of this rubber softener may be necessary to obtain the results desired.

In extreme cold weather this treatment should be repeated approximately once a month. Cold weather has a tendency to cause this rubber to appear hardened, or less resilient, which causes the door to be loose in the opening, resulting in movement and noise.

The door adjustment should be checked with the windows down, (to prevent the body from becoming air bound, which may cause hard closing doors) and the door lock striker set on the center pillar to hold the door tight to the body when closed.

Refer to Page 3, Door Alignment. And Page 4 on Door Lock Striker and Dovetail Adjustment.

WINDSHIELDS

Removing a Windshield

The windshield consists of two laminated glass sections which are set into a rubber windshield glass channel. This assembly when installed in the windshield body opening is set against a stainless steel moulding as shown in Fig. 6. The windshield is held in position by the windshield finish moulding.

In removing a windshield, first remove the windshield finish moulding screws and the moulding, also the windshield center strip from inside the car.

One half of the windshield can be installed without removing the other half. If the half section that is to be removed is still intact, rap the glass at a point farthest from the center, with a soft rubber hammer or use the fleshy part of your hand. Break the seal and start the end of the glass in toward the inside of the car. When the end that is farthest from the center is free of the windshield opening, roll the rubber channel off the end of the glass and pull the glass out of the rubber channel.

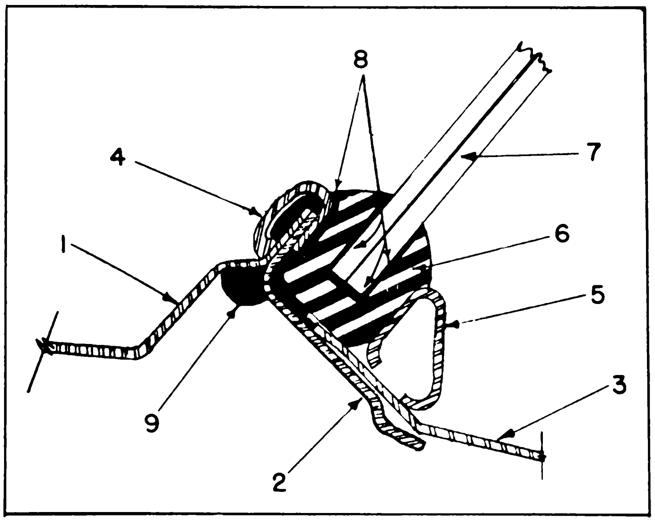


Figure 6—Cross Section of the Windshield Mounting at Cowl Top.

1. Cowl Top (Welded to cowl rail in windshield opening)
2. Cowl Rail (Welded to cowl top in windshield opening)
3. Instrument panel (Welded and screwed to cowl rail)
4. Stainless Steel Reveal Moulding (Sealed with rubber cement)
5. Finish Moulding
6. Windshield Glass Channel (Rubber)
7. Windshield
8. Rubber Cement (Sealing glass in glass channel and glass channel to cowl rail flange)
9. Black Putty (Sealing cowl rail and cowl top)

Installing Windshield

Clean the rubber channel thoroughly and inspect the stainless steel reveal moulding for kinks that might cause a water leak.

Lay a good ribbon of Nash windshield rubber cement in the rubber channel and insert the glass in the channel, rolling the outer end of the rubber channel over the outer end of the glass.

> CAUTION: *Make sure that there is enough sealing cement in the rubber channel to cause a surplus to be forced out when the windshield is pushed into place.*

Before working the glass assembly into the windshield body opening, coat with rubber cement that surface of the stainless steel reveal moulding that contacts the rubber moulding of the windshield. Then push the windshield into the opening and draw it up tight to the reveal moulding with the screws of the windshield finish moulding.

Use a body cement gun to seal the opening between the windshield rubber channel and the windshield glass, also between the rubber channel and the stainless steel reveal moulding.

Use Nash Black Putty sealing compound under the dash to seal the joint between the cowl top and the cowl rail Number 9, Fig. 6.

Water Leaks—All Series

Apply air or water to the body or drive car in a heavy rain and locate original source of leaks. If leaks are found at the following points, apply the corrections listed.

1. Between the Cowl Top and Weather Eye Hopper

Remove the cowl ventilator hood. Refer to Page 5, Weather Eye Section of this Manual.

Remove cowl ventilator cover.

Check seal covering joint of Weather Eye hopper and cowl top in trough around cowl ventilator opening of cowl top, and reseal if necessary.

Caution should be exercised in this inspection. If spot weld marks show pin holes they should also be sealed. Use Nash rubber cement.

2. Screws Holding Radiator Brace Rods to Cowl Top

41-42-46-47-4840 Series

Loosen screws—on cowl top only—raise brace rods, apply rubber cement under brace rod and around screw. Retighten.

41-42-46-47-4860 Series

These tapped holes are not used but are sealed with rubber plugs. If water enters around these plugs they should be covered with rubber cement.

3. Screws Holding Hood Lacing to Cowl Top

Loosen screws and raise rubber hood lacing. Apply rubber cement around screws under rubber hood lacing and retighten screws.

4. Around Windshield Wiper Shaft and Cowl Top

There is a leather washer under the wiper shaft spacer which serves as a seal if kept tight. However, if water enters between the spacer and shaft—

Remove blade and arm.

Loosen nut and raise spacer.

Apply rubber cement between shaft housing and leather washer.

Retighten and install arm and blade.

5. Between Windshield Wiper Shaft and Housing

NOTE: *THIS IS CORRECTED ONLY BY LUBRICATION.*

Remove blade, arm and serrated driver, which is held in place with a cotter key.

Use windshield wiper shaft lubricator (Kent-Moore No. J-1643).

Windshield wiper motor should be in operation while lubricating.

6. Water Leaks at Windshield

1. Water leaking between the cowl top and the cowl rail. Use Nash Black Putty to seal the joint between the cowl top and the cowl rail as shown at 9, Fig. 6.

2. Water leaking under the finish moulding on top of the instrument panel. Use Nash Rubber Cement and seal between the windshield rubber glass channel and the stainless steel reveal moulding, as shown at 8, Fig. 6.

3. Water leaking between the windshield and the glass rubber channel, at the lower corners. Use Nash Rubber Cement and seal the points as outlined at 8, Fig. 6.

If leakage appears at the center division bar, it is necessary to seal this part of the windshield only.

In cases of leakage at the stainless steel reveal moulding, do not remove windshield glasses and reveal moulding to reseal. It is only necessary to remove the glove box, clean the metal joint of all oil and foreign matter and apply Nash black putty, as shown at No. 9, Fig. 6. This is sealed on the inside under the cowl behind the instrument panel.

If leakage is between glass and rubber, it is only necessary to remove the grained finish moulding, pry down the sealer rubber lip No. 6, Fig. 6 and apply Nash rubber cement.

If leakage is between the rubber glass channel and the top edge of the reveal moulding, it is then necessary to remove the grained finish moulding, loosen the rubber glass channel and apply rubber cement as shown at No. 8, Fig. 6.

APPEARANCE

Cleaning Upholstery

There are a few items of a general nature to bear in mind when cleaning upholstery fabrics. On seat cushions and seat backs, do not saturate to the extent that pads become wet.

In removing spots from a headlining, do not rub against the nap. If this should happen, smooth the material by rubbing with the nap while cloth is damp. Also, do not push against headlining to cause material to contact the roof insulation, as this might further stain the headlining.

On upholstery which is backed with ragboard, be careful not to wet the cloth to the extent that the composition of the ragboard stains the trim material.

Type of Upholstery

In general, two types of upholstery are used in automobiles—flat fabrics which include broadcloth, whip cord, and leather; and mohair fabrics, which are pile fabrics.

A flat fabric is one that is woven in such a manner that the fibers lie flat, the sides of the many fibers forming the wearing surface. A pile fabric is woven so that the fibers stand erect, thousands of them to the square inch, and these ends form the wearing surface of the material.

Removing Stains

The following suggestions will be helpful in removing stains: Note: In using cleaning fluids, always follow the procedure commonly used in cleaning clothes; that is, dampen a clean cloth with the fluid and start rubbing lightly around the OUTSIDE of the spot, gradually working to the center. This method keeps the spot from spreading and is less likely to leave a ring.

CAUTION: *Avoid the use of hot water except where specifically recommended.*

Battery Acid

Pour household ammonia directly on the spot and allow it to remain for one minute. Rinse with cold water. It is essential that this treatment be applied at once, as the acid will eat a hole in the fabric within a few hours.

Grease and Oil Stains

Use Nash Fabric Cleaner. If the fabric is saturated with oil, pour the fluid on the spot and soak it up by pressing a white blotter on the spot. Do this before cleaning with a cloth dampened with the fluid.

Blood Stains

Use cold water. If this does not remove the entire stain, pour ammonia on spot, and rub with a clean cloth. NOTE: Never use hot water on a blood stain, as this will only set the stain.

Candy Stains

Use hot water on all candy stains that do not contain chocolate. For a chocolate stain, first rub out the stain with a clean cloth dampened with Nash Fabric Cleaner. Then scrape with a dull knife and rinse with cold water. In both cases, after the spot has dried, it is advisable to finish the job with Nash Fabric Cleaner.

Fruit Stains

Rub vigorously with a cloth dampened in hot water. When dry use Nash Fabric Cleaner.

Ice Cream

Follow the same procedure as for fruit stains.

Lipstick

Pour a small quantity of Nash Fabric Cleaner directly on the spot. Press a clean white blotter over the stain. Repeat this process, using a new blotter each time until no stain remains.

Nausea Stains

Use warm soapsuds. Sponge the stained area until stain is removed. Brush with a whisk broom, with the pile when wet and against the pile when dry.

Milk Stains

Follow the same procedure as for nausea stains.

Water Spots

Sponge the entire panel with a cloth dampened with cold water, and then sponge the spots with Nash Fabric Cleaner.

Chewing Gum

Moisten the gum with Nash Fabric Cleaner. Remove with a dull knife, and then finish with Nash Fabric Cleaner.

Renovating Mohair Upholstery

If the car is trimmed with mohair upholstery, the fabric pile may, after a long period of time, become slightly flattened or "shiny." If this happens, it is a very simple matter to restore the pile.

Dampen a clean cloth, and spread it over the pressed down portion of the upholstery. Then press a hot iron over the cloth lightly. This will drive the steam into the core of the resilient fibers and cause them to spring erect. Should the pile be crushed down badly, it may be necessary to repeat this several times.

Cleaning Leather

The cause of stickiness and loss of luster on leather upholstery is due largely to the use of polishes or cleaning preparations which injure the surface finish. Maintaining a bright and clean finish on leather upholstery is comparatively simple when correctly handled, and the following method is suggested:

Apply damp (not wet) cloth with Castile soap and rub the surface of the leather briskly. Next, apply a moist cloth without soap. Finish by rubbing dry with a clean soft cloth. The gloss finish of the leather may disappear during the first operation. However, it will be restored by the friction produced by the dry cloth.

Under no circumstances use furniture polishes, oils, or varnishes on leather upholstery.

RUG MATERIAL

Cleaning Rug Material

Rug material on the rear seat floor, footrest, end facings of the front seat and on door trim panels occasionally requires cleaning, which may be done with a whisk broom or vacuum cleaner.

> NOTE: *This material is set into a rubber base, and the use of any fabric cleaner or gasoline serves as a solvent which will cause the nap to be loosened and come out.*

Removing Spots

Use Ivory soap suds, with sponge, wiping suds off with dampened sponge. Do not use water excessively. When dry, brush with a whisk broom.

GLASS—CARE AND HANDLING

Cleaning Glass

Clean windshields and windows promote safety and comfort in driving. Care in cleaning should be exercised.

Do not clean glass with chamois or cloths which have been used to wash the car or permitted to collect dirt and fine grit or sand, as this causes fine scratches in the glass which may tend to obstruct the vision.

Signs and Labels

Certain adhesive materials used for pasting signs or labels on the glass cannot be removed without causing pits in the glass.

Chromium Plated Parts

Chromium plated parts should be wiped occasionally with a cloth dampened with light oil or kerosene. Rust spots or tarnish on chrome can be removed with Nash Chrome Cleaner.

Stainless Steel Parts

Trimmings such as body belt mouldings, door, rear quarter window, rear window, and windshield reveal mouldings, should be cleaned with Nash Chrome Cleaner. Under certain conditions of operation, a corrosion may develop on the stainless steel parts that will, if allowed to go without an occasional cleaning, make the part appear as if rusted.

PAINT

Care of Finish

Nash-built cars have baked enamel finish on fenders, hood and body. This finish is exceptionally durable and has a beautiful high gloss. Under ordinary conditions, the finish will require but little attention to preserve it for a long period.

Washing

As the car becomes covered with grit or mud, it should be washed, rather than cleaned with a dry cloth, to avoid scratches to the finish. Wash the car only when out of the rays of the sun, and after the metal surface has been allowed to cool. Use cold water and dry with a clean chamois.

Polishing New Cars

While this type of finish will maintain a high gloss for a long period, it will be necessary at certain intervals, depending entirely on climatic conditions to which the car is exposed, to clean the finish in a more thorough manner than merely washing. When the surface film, which will naturally accumulate, cannot be removed by washing, the finish should be cleaned with Nash liquid polish and cleaner, rubbing sufficiently to clean the surface thoroughly, following with a brisk circular motion with a soft dry cloth.

Polishing and Waxing

Where the finish of a car has been neglected and has oxidized through weathering, use Nash Cleaner and Wax Polish, which will remove the road film and restore the finish to a long-lasting, high gloss.

Rust

The body, as well as other sheet metal parts are protected from the action of rust by a "Bonderizing" process. Where the paint finish may be damaged in such a way that bare metal is exposed the "Bonderizing" will prevent the spread of rust to a greater area. It is, however, to the advantage of the car owner to have such damage properly repaired. For this reason, a special line of paint material has been developed for repairing this type of finish.

Road Tar or Oil

The use of a good standard brand of tar remover will remove oil or tar without injury to the finish. However, if the tar has hardened, it should be softened first with butter or gasoline. If gasoline is used, be sure that it does not contain coloring matter or Ethyl fluid. After removing the tar, it is advisable to apply polish.

Salt Air

A little extra attention should be given to cars operated near the seashore. The body and sheet metal should be polished carefully every three months. Chromium plating also should be cleaned at the same time.

MAJOR BODY REPAIR SECTION

In this section of the manual a few examples of body repair are shown where the replacement of a panel is required. Here it can be seen how simple it actually is to work on Nash Bodies *when it is known how they are put together.*

Estimating the job and ordering the parts required to complete the work is of vital importance.

Ordering Parts

To eliminate any possible delay in the shipment of the correct parts ordered, it is important that all orders include the following information:

- Model Number
- Service Serial Number (if any)
- Serial Number
- Body Number
- Trim Number
- Paint Number

Reference to where these numbers can be found is outlined on Page 00 of this section.

This information will enable those who make up and supply the parts to avoid any possible error and have the correct parts shipped as required.

For Example—Ordering Paint

Service Serial Number	N6-50273
Model Number	4168
Serial Number	R-353001
Body Number	6720
Trim Number	671
Paint Number	116

Ghost Gray for upper body or Shadow Gray for lower body.

REMOVAL AND CARE OF PARTS

In almost all types of accidents there are certain parts that it is necessary to remove in order to provide adequate room for repairing or aligning others that are damaged. Those parts that are removed, whether damaged or not, should be placed in boxes to eliminate any further damage and, most important, the possibility of being misplaced or lost.

In cases where the body is damaged, the trimmed parts, all of which are very easily removed, should be completely removed from the car and kept in a clean store room or locker. This will provide better visibility during the repair and aligning operations and save considerable time in measuring and placing jacks, and will also eliminate the possibility of crushing, tearing, burning or soiling the upholstered parts.

Alignment

The first checking operations to be performed are for proper alignment. The aligning work may be divided into two types for the 40-60 and 80 series.

On the 41-42-46-47-4840 series, the underbody and frame are one unit. Alignment work here is divided into Underbody and Chassis as one type, and Body Upper Structure as the other.

On the 41-42-46-47-4860 series, and the 41-4280 series, Chassis Alignment and Body Alignment are the two divisions of the work.

On all series of cars, misalignment in the chassis is apparent when the rear wheels do not follow in the tracks of the front wheels. However, check *first* to make sure the trouble is not being caused by bent axles, torque tubes, stabilizer bar or bracket, control arms, or broken springs, etc.

Fig. 3 on Page 3, of the Frame Section, is the chart of the underbody and frame measurements for the 46-47-4840 series. Fig. 2 on Page 3 gives the same information for the 41-4240 series. Fig. 4 on Page 4 is the chassis frame chart with various measurements for the 41-4260-80, 46-47-4860 series.

If the body has been bent, it may be restored to its proper dimensions by using the check points given in the charts. In the case of the 60 and 80 series, although the body construction is the same as for the 40 series, the repair work is different. In these cars the chassis should be aligned first and then the underbody straightened to fit. After the underbody unit has been exactly aligned, the body pillars and upper structure may be straightened to provide the true sizes of each of the openings for the doors, windshield and rear window. When the work is completed, the 60 and 80 series body is mounted on the chassis. The body mounting points and their method of assembly are shown in Fig. 5 of the Frame Section. In each case the location of the mounting is indicated in Fig. 4 of the Frame Section.

BODY FRAME AND CHASSIS

The construction of the steel underbody floor incorporates a box section frame to support the front suspension, unit power plant, rear springs and axle. This frame is an integral part of the underbody and is welded to the body floor—the body upper structure, in turn, being welded to this unit.

The cross members, which serve as the front axle for the front suspension and the engine rear support, are removable to facilitate servicing of these units. They are bolted to the body frame.

Figs. 2 and 3, Page 3 of the Frame Section, show the essential BODY FRAME dimensions to assist in straightening these members. Uniformity of dimensions, determined by diagonal checks on the body floor or body frame, must be maintained within close limits.

All dimensions must be held to within three-sixteenths of an inch, and even closer limits may be required for front suspension or unit power plant mounting points. The use of a chassis checking tram, which consists of a telescopic bar having three adjustable locating pointers, is essential for obtaining these close measurements.

The 41-4260-80 and 46-47-4860 chassis frames are of conventional design. They consist of heavy gauge side rails with a welded box section for the greater portion of their length. Beyond the box section, side rails extend front and rear in the form of a deep drawn "U" channel.

Fig. 4, Page 4, of the Frame Section, shows essential frame dimensions to assist in straightening the frame members if damaged.

Uniformity of dimension, determined by diagonal checks, must be maintained within close limits.

NOTE: *In Fig. 4 of the Frame Section the location of the rear engine support cross member is farther back in the 80 series than in the 60 series. Thus the dimensions from the front end of each side rail diagonally across to the opposite side of the rear corner of the rear engine support cross member is 65 1/16" for the 41-4280 series, whereas the same dimensions on the 41-42-46-47-4860 series are 61 13/16".*

REPAIRING THE DAMAGE

To Raise and Support the Car Body 41-42-46-47-4840 Series

The rear fenders on 41-42-46-47-4840 series cars are deeply crowned and in effect are built-in rear wheel shields. This construction makes it necessary to support the body by locating body jacks under

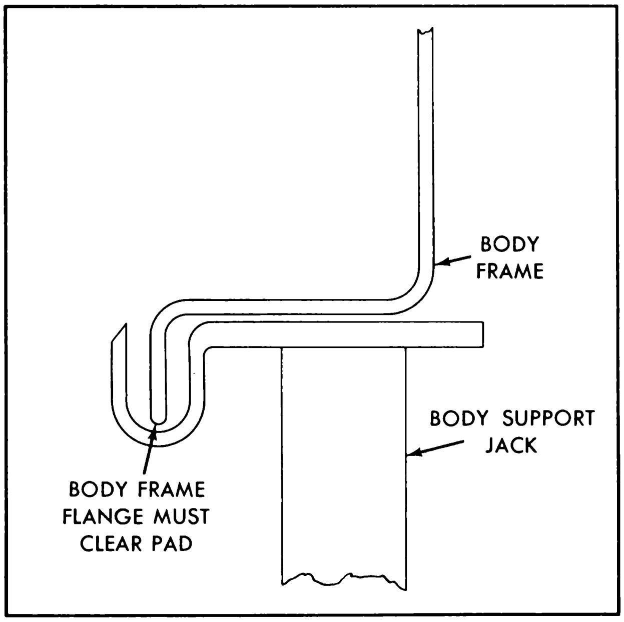


Figure 7—Top Pad for Body Support Jack.

the body frame so that the rear axle will hang suspended to permit removal of rear wheels.

After the entire rear end of the car has been raised by placing a jack under the rear axle differential, or by means of a chain hoist and cable attached to the rear bumper mounting, locate the body supporting jacks under the body frame section approximately six inches forward from the front end of the rear fender. Under no circumstances should insecure body support jacks be used.

Body support jacks should be of steel, with a properly formed top pad so the car cannot slip, and with a broad base to prevent tipping. The pad of the body support jack should be formed as shown in Fig. 7 so that the weight of the car will not rest on the body frame flange which projects below the frame.

If wooden horses are used, one should be installed on either side crossways of the body frame. Provide cut-outs in the top surface of the horse for the body frame flanges which project below the frame.

Applying Power Tools for Alignment

It must be remembered that the complete and satisfactory straightening of both the floor and upper body panels cannot be accomplished through the use of power tools on the floor assembly alone.

When the accident occurred, the damage to the individual part that was hit, transmitted pressure to all its connecting parts, which were damaged proportionately. It is, therefore, proper that the preliminary straightening and aligning start at the point of impact with pressure applied in the opposite direction from which it was received. In this way the panels that were damaged together can be re-aligned almost to their original condition.

Straightening and Smoothing Out

The final straightening and smoothing out of each panel will require whatever disassembly is necessary to make the panel accessible for straightening.

Therefore, it is important to know the construction so that the joints and welds can be readily located. To eliminate any possible error, it is wise to review again the various parts of each assembly, and their relation to all of the sub-assemblies. We find in Fig. 8, ASSEMBLY 1, a skeleton body showing the exterior welding, outlining how one part is connected to another.

Assembly 2

Note that the floor side sill panel extends from the front to the rear of the body and, when welded to the floor panels, makes up the under body floor and frame unit as shown in Fig. 8, ASSEMBLY 2. This leaves exposed an open channel which is reinforced at the front and rear by additional reinforcing panels, vertically ribbed for additional strength through the center. This reinforced U-shaped channel is provided with an upper and lower flange to which the Rear Quarter Side Panel Assembly, Body Side Sill Panel, Cowl Side Panel Assembly and Front Wheel-House Panel are welded, forming a box section sill from front to rear.

It may be necessary to cut the welds of one or more of these panels to relieve the strain and to facilitate the proper straightening and smoothing out of the damaged area.

Reinforcing

If, after aligning a damaged sill panel, it is found that straightening would not be satisfactory—or after the straightening it was decided a reinforcement would be required—a new sill panel with the top flange removed can be fitted and welded to the old sill panel as a reinforcement. This will save the expense of removing the old sill panel and of the re-sealing operation where it joins the floor panels.

Replacing Floor Side Sill Panel

This panel should not be replaced as a complete unit unless the whole side from front to rear is damaged. It is better practice to cut from the replacement panel only enough to cover the section that is damaged—plus enough extra metal to provide a satisfactory lap joint. After the damaged section is removed, the edge of the new panel can be welded to the surface of the old panel and the edge of the old panel welded to the surface of the new panel, thus providing a double weld which serves as a reinforcement of the union.

Compare the floor side sill panel shown in Fig. 8, ASSEMBLY 2, with the body side panels shown in Fig. 9, ASSEMBLY 1, to obtain the relative location of each body side panel to the side sill panel.

Straightening Main Body Sill

Clamp a block to the main sill, against the floor reinforcement strainer. The body clamp will sup-

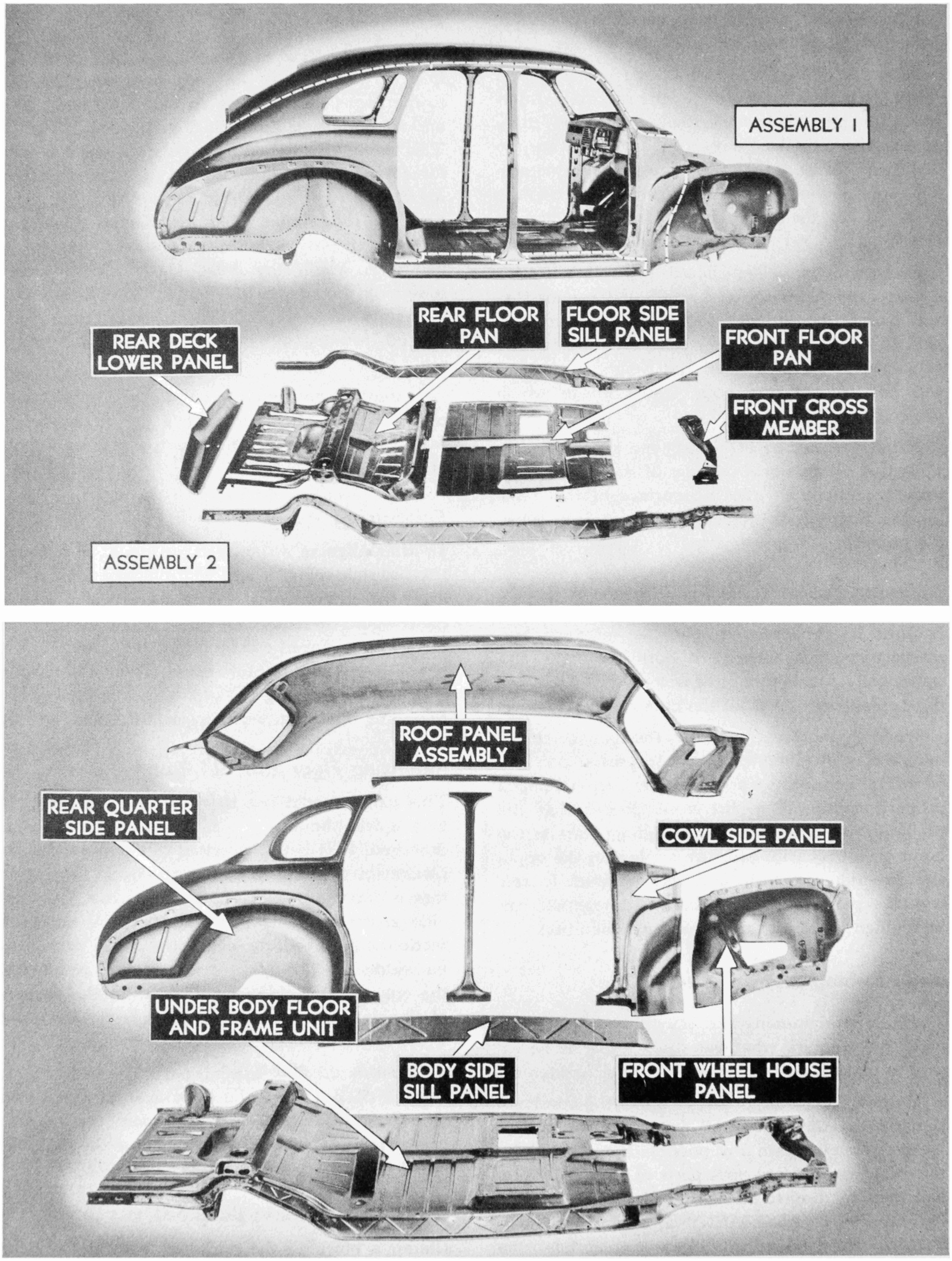

ASSEMBLY I
REAR FLOOR PAN
FLOOR SIDE SILL PANEL
REAR DECK LOWER PANEL
FRONT FLOOR PAN
FRONT CROSS MEMBER
ASSEMBLY 2
ROOF PANEL ASSEMBLY
REAR QUARTER SIDE PANEL
COWL SIDE PANEL
UNDER BODY FLOOR AND FRAME UNIT
BODY SIDE SILL PANEL
FRONT WHEEL HOUSE PANEL

Figure 8—Skeleton Body, Floor Parts, Panels and Assemblies—41-4240 Series.

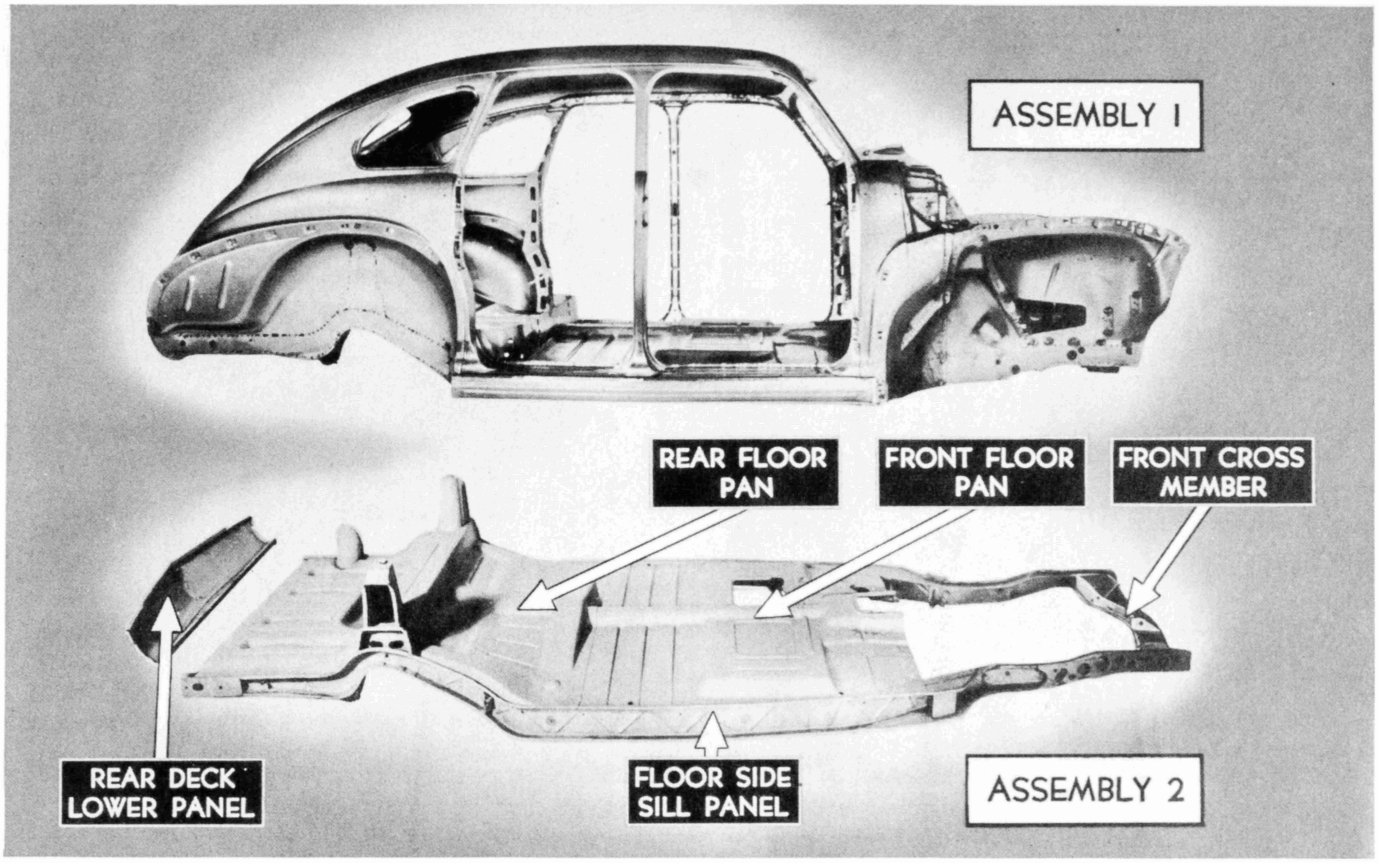


Figure 9—Skeleton Body and Floor Parts—46-47-4840 Series.

port the sill sides. Use a jack to force the sill into position. (Fig. 10.)

Body Alignment

After the body floor and frame unit have been aligned, the body upper structure should be squared up. In doing this the badly damaged sections should be roughed out just about into position. These preliminary operations are necessary in many cases, and in almost every instance they will save a good deal of time.

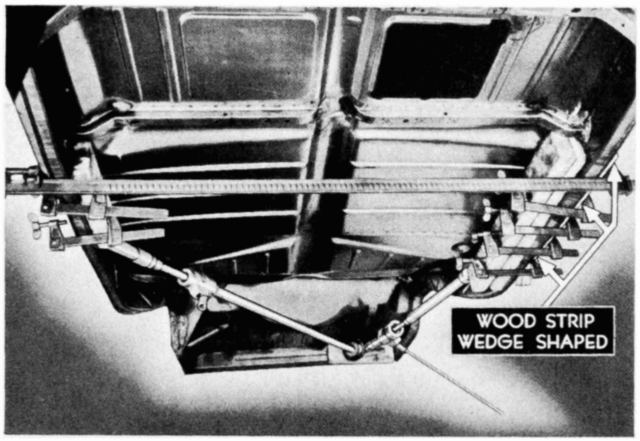


Figure 10—Straightening left main sill and trunk floor. Note location of body jacks and wood blocks clamped to main sill against floor reinforcement strainers with body clamp supporting sill sides. A WEDGE SHAPED WOOD BLOCK and strip of wood is necessary on outside of sill for the "C" clamps.

The final operations of squaring up and straightening should be performed with care to provide the proper dimensions for all the door, deck cover, windshield, and rear window openings that may have been affected by the accident. This can be accomplished accurately by careful measuring.

Measuring

The measurements required for the squaring up operations are vertical, diagonal, and horizontal. The measurements taken on one side of the body should check with the measurement taken between the same two points on the opposite side of the body.

When differences are found in each of the vertical, diagonal, and horizontal measurements in the relation of one side of the body to the other between the same points, the exact position of any misalignment is shown. It can then be easily determined in what position the body jack or jacks should be placed to produce the proper results in straightening or aligning. All measurements may be taken and checked with a body checking tram.

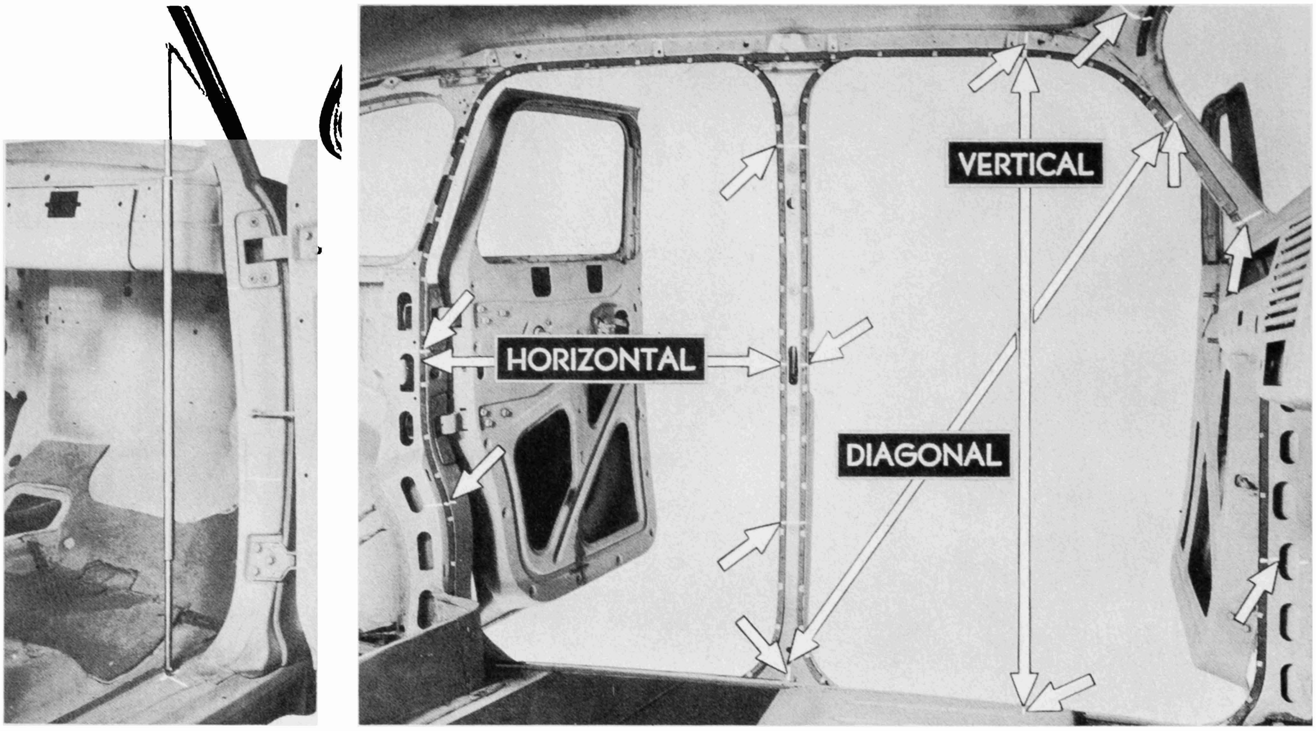


Figure 11—Placing marks for measurements to be taken on the Front, Center and Rear Quarter Body Pillars, then taking a vertical measurement on Right Front Body Pillar.

This has a telescopic action that will permit adjustment to the desired length, and a thumb screw to lock it in position. Great care should be exercised to place the tram exactly on the marks and in the same position at which the first or opposite measurement was taken.

Vertical Measurements

Vertical measurements should be made first. These measurements are taken from the top of the body floor at the sill, moving "Up" the same distance on each of the front, center, and rear quarter body pillars—on both sides of the body. (Fig. 11.) Chalk should be used to mark the sill and the body pillars at the exact points where measurements are taken. In some cases (according to the location of the damage) two or three measurements on each body pillar are very useful not only in checking the correct contour of the pillars, but also for taking horizontal and diagonal measurements.

Horizontal Measurements

Horizontal measurements are taken on a level at the markings set by the vertical measurements. They are taken parallel to the floor or roof assemblies to check the width of the door, windshield, or rear window openings.

For example: Fig. 12—the vertical measurements on both front body pillars and center body pillars are marked at 12″, 24″, and 40″ upward from the top of the floor or sill. The horizontal measurement would be the distance between the two front body pillars, the two center body pillars,

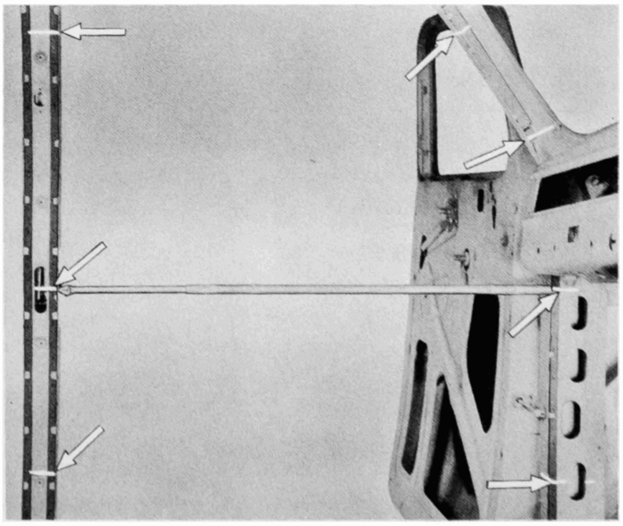


Figure 12—Horizontal measurement between Front and Center Body Pillar.

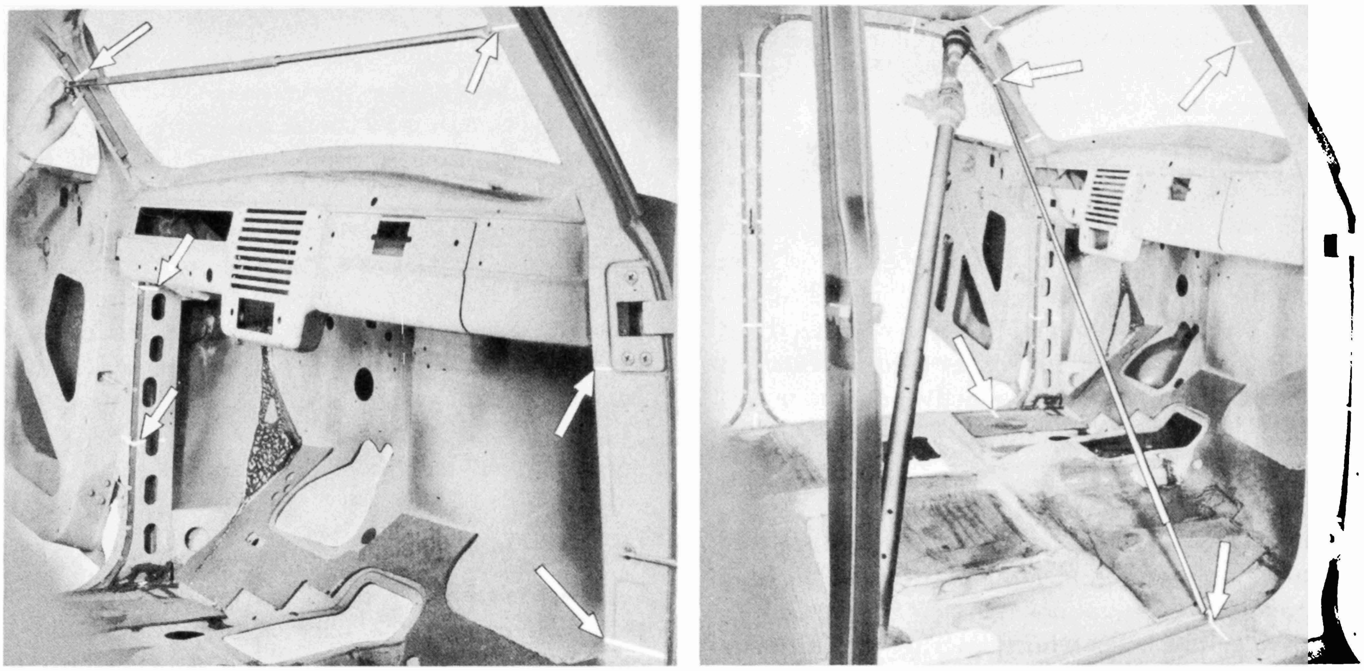


Figure 13—Horizontal measurements between the Right and Left Front, Body Pillars. Measure diagonally from bottom of Right Front Body Pillar tc the top of Left Front Body Pillar. Body Jack is in position to force front body pillar and roof forward and out.

or the right front and the right center body pillar, etc., at marks which are the same distance from the floor. These measurements are used in checking the correct distance or spacing between the body pillars for proper and true openings.

Diagonal Measurements

The diagonal measurements used in the squaring-up operations are taken at the markings set by the vertical measurements. For example: Fig. 13.

1. Set one end of the tram on a fixed location at the bottom of the right front body pillar and adjust the other end of the tram to the top vertical marking on the left front body pillar. Lock the tram at this measurement. Then check between a similar fixed location at the bottom of the left front body pillar and the top vertical marking of the right front body pillar. These two measurements should be the same. If it is found that there is a difference, this will indicate that this part of the body has been forced sideways.

To square it up, the jack or power tools should be placed to force the body in the direction of the shortest measurement, a little more than one-half the difference between the two measurements. An additional $3/16''$ should be allowed to compensate for the internal strains pulling the damaged area back after removing the forcing tools.

2. Set one end of the tram on the top vertical marking of the right front body pillar and adjust the other end of the tram to contact a fixed location at the bottom of the left center body pillar, locking the tram at this measurement. Then check between the top vertical marking on the left front body pillar and a similar fixed location at the bottom of the right center body pillar. (Fig. 14.) If it is found that there is a difference, this will indicate that the body has been forced sideways and back. Then the jack should be placed at the same angle as measured to force the body out in the direction of the shortest measurement.

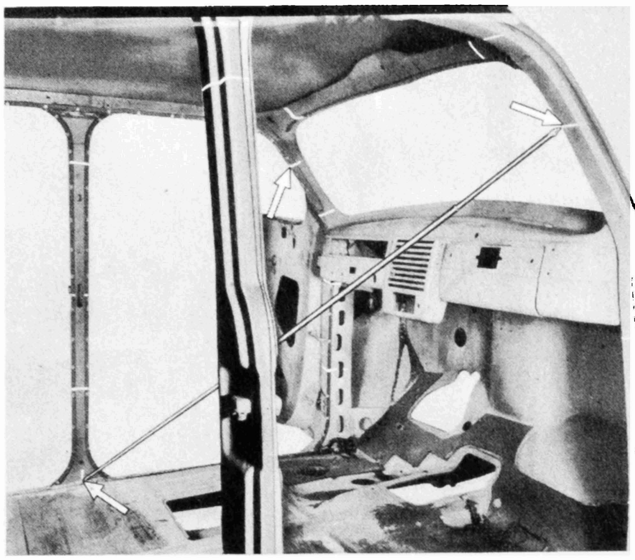


Figure 14—Checking measurements between bottom of Center Body Pillar and top of Front Body Pillars, diagonally across the body.

3. Set one end of the tram on the top vertical marking of the right front body pillar and adjust the other end of the tram to contact the bottom vertical marking on the right center body pillar. Check with the same measurement on the left side of the body.

This will indicate to what degree force should be applied to square up the door opening or if an adjustable rod clamp should be applied to maintain the correct measurement from being disturbed while the operation of forcing is being performed at another angle on the same body pillar.

Normalizing

Normalizing is a heating process to reduce the internal strains set up in the metal by the bending and re-aligning operations. It can be applied to any part of the body where internal strains must be relieved, by heating at the bent or buckled areas. This is accomplished while the body jack or forcing tool is in place, and after that part of the damaged area has been forced to its proper location. For example: Fig. 15—points "A" are to be heated for Normalizing. The torch may be applied, heating those parts that are buckled and wrinkled to a dark red color. The body jack should be left in place at a moderate tension while the heated metal is allowed to cool slowly. This process will almost remove the wrinkles, and will relieve the internal strains.

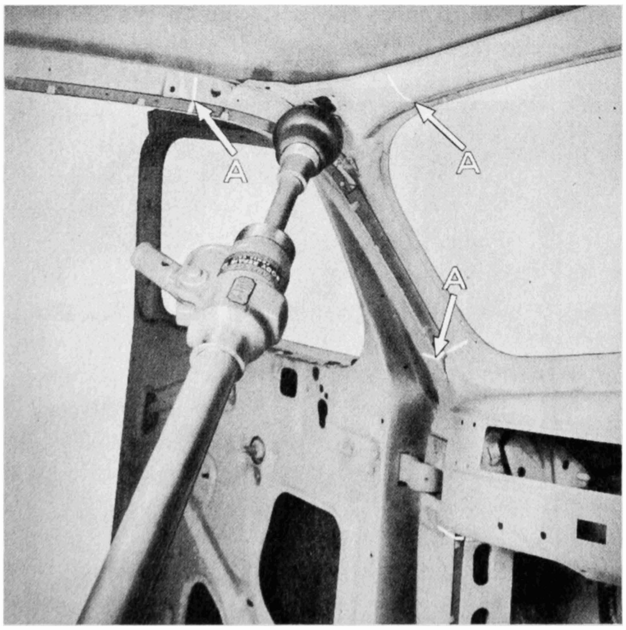


Figure 15—Preparation for Normalizing. Body Jack is in position under moderate tension. Marks "A" are points to be heated for Normalizing.

Installing New Panels

The various assembled sections or any of the individual panels that are shown available for replacement, are complete as shown and may be installed as complete units. In some cases, however, only a portion of the unit is damaged beyond repair, and to install a complete new panel or unit would require a considerable amount of unnecessary labor. It is therefore suggested that, in such cases, the damaged sections be cut out at the location best suited for welding. This new unit should then be cut to the desired size, and welded in place. Following this method reduces the cost of the operation and saves considerable time.

Time Saving Suggestions

In cases where any panel or section is not completely damaged, the part of these units that is damaged can be replaced in the same manner as shown in the operation of replacing a damaged roof panel, and without replacing the complete part as serviced. Considerable time and expense can be saved by not having to remove and reweld the cowl top to the cowl sides and the dash panel, remove and reweld the front body pillar panels to their inner reinforcements, or remove and re-align the hood. This type of repair can be applied to almost any of the major assemblies after careful study of the parts available for service and their locations relative to the damaged part of the body.

Repairing Broken Welds

After the body has been squared up and any new panels have been welded in, it is important that the body be checked very carefully for broken welds, which can be repaired by gas welding. Broken electric spot-welds at locations where the metal laps, should be gas welded along the lapping edge of each panel, or on both sides. This will form a more rigid reinforcement and serve the same purpose as the original electric spot-welding.

Resealing

After the body has been repaired and before the trim material is installed, it should be inspected carefully and, if necessary, resealed to prevent air, dust, or water leakage. The places to inspect and reseal are: joint between body floor and side panels from front of dash to rear of trunk, (Fig. 16) joints between roof panel and main roof rail section. (Fig. 17) rear deck drain trough corners,

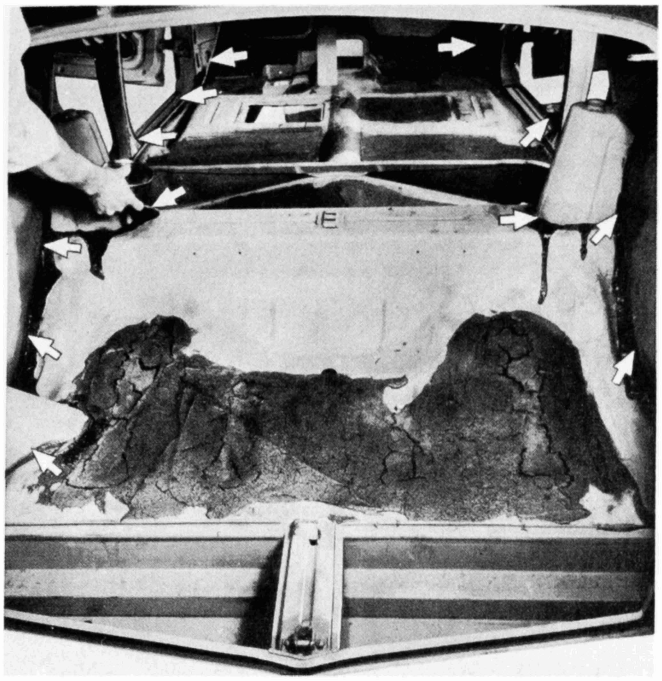


Figure 16—Applying Body Sealer. Using oil can to seal joint of body floor with side quarter and sill panels from front of dash to rear of tool compartment.

sealer rubber and exterior hinges, tail lights, belt moulding clips, fender bolts at cowl and rear quarter, windshield and rear window sealer rubbers.

Replacing Insulating Material

On the body floor, under the front mat and rear carpet, heavy insulating pads serve as a sound deadener. The pads are fastened down with an adhesive material known as Sand Mortex. The trunk floor side quarter panels and doors are also insulated with Sand Mortex. Before trim material is installed on repaired panels, the Sand Mortex should be replaced (Fig. 18). In most cases the insulating pads can be re-used, but it will be necessary to use new Sand Mortex. The adhesive Sand Mortex may be smoothed out with a trowel or brush, then allowed to set up and dry.

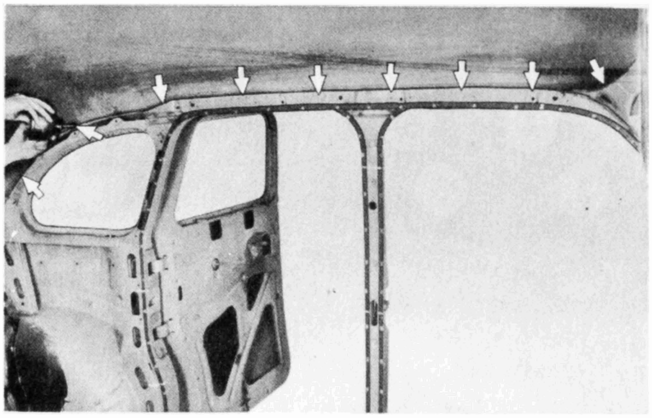


Figure 17—Applying Body Sealer. Sealing joint of roof panel to body, from windshield to rear deck opening.

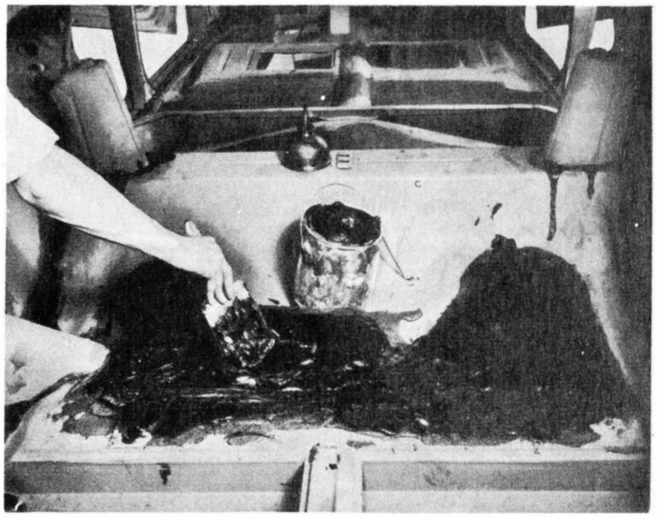


Figure 18—Replacing Sound Deadener on Trunk Floor.

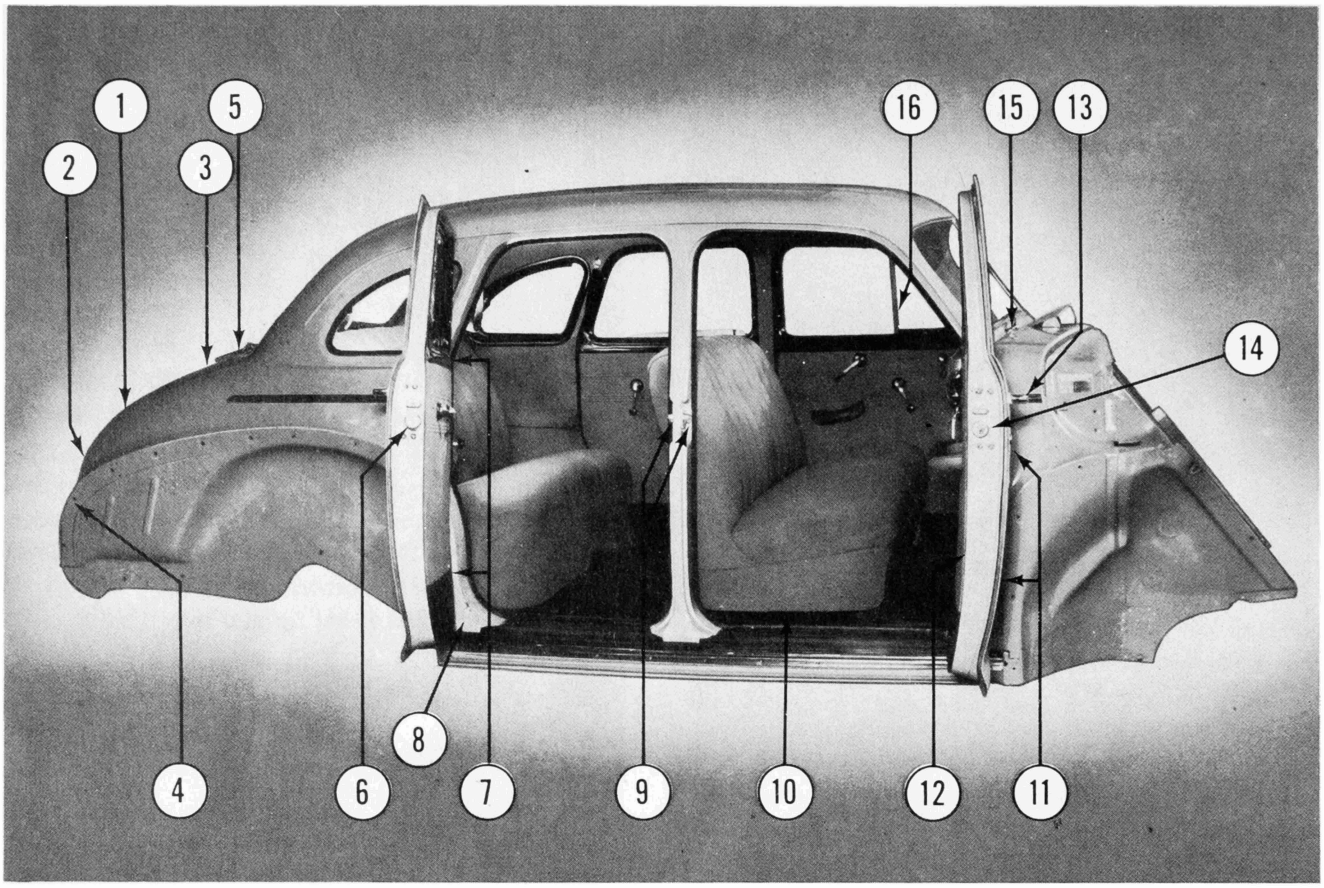


Figure 19—Body Lubrication Chart—41-4240-60-80, 46-47-4840-60 Series.

1. **DECK COVER KEY LOCK HANDLE**
   (Use finely powdered graphite)
2. **DECK COVER LOCK**
   (Use stainless lubricant applied with small brush)
3. **DECK COVER STAY HINGE**
   (Use stainless lubricant in channel of slides)
4. **DECK COVER LOCK STRIKER**
   (Use stainless lubricant in striker and catch)
5. **DECK COVER CONCEALED HINGES**
   Fast Back Models
   (Lubricate hinge pins—use stainless lubricant applied with a small brush)
6. **REAR DOOR LOCK AND ROTOR**
   (Use light oil in two oil holes above rotor for lock mechanism and cams. Use stainless lubricant on rotor)
7. **REAR DOOR HINGES**
   (Oil hole in center of hinge visible when door is open. Use pressure gun)
8. **REAR DOOR CHECK**
   (Use soft grease applied to link with small brush)
9. **CENTER PILLAR LOCK STRIKER**
   (Use stainless lubricant on both sides applied with small brush)
10. **SEAT ADJUSTER SLIDES**
    (Lubricate top and bottom sides of slides in channel at each end on rollers, sprocket teeth and slide rack. Use soft grease)
11. **FRONT DOOR HINGES**
    (Oil hole in center of hinge visible when door is open. Use pressure gun)
12. **FRONT DOOR CHECK CLIP**
    (Lubricate clip in door. Use soft grease. Loosen trim panel, apply with brush)
13. **FRONT DOOR KEY LOCK**
    (Use finely powdered graphite)
14. **FRONT DOOR LOCK**
    (Use light oil in two oil holes above rotor for lock mechanism and cams. Use stainless lubricant on rotor)
15. **WINDSHIELD WIPER SHAFTS**
    Large Motor Only
    (Use special fitting and pressure gun to apply Lubriplate)
16. **GLASS CHANNELS**
    (Use flake graphite only)

NASH PASSENGER CAR

MODEL CHART

MODEL NUMBER					BODY STYLE	No. Passengers
40 Series						
4140	4240	4640	4740	4840	4-Dr. Sedan Trunk Delux	6
4142	4242	—	—	4842	Bus. Coupe Delux	3
4143	4243	4643	4743	4843	2-Dr. Brougham Delux	6
4145	—	—	—	—	Bus. Coupe Special	3
4146	—	—	—	—	2-Dr. Sedan Slipstream Special	6
4147	—	—	—	—	4-Dr. Sedan Slipstream Special	6
4148	4248	4648	4748	4848	4-Dr. Sedan Slipstream Delux	6
4149	4249	4649	—	—	2-Dr. Sedan Slipstream Delux	6
—	—	—	—	4850	4-Dr. Trunk Sedan Custom	6
—	—	—	—	4853	2-Dr. Brougham Custom	6
—	—	—	—	4858	4-Dr. Sedan Slipstream Custom	6
60 Series						
4160	4260	4660	4760	4860	4-Dr. Sedan Trunk	6
4161	—	—	—	—	Cabriolet	5
4162	4262	—	—	—	Bus. Coupe	3
4163	4263	4663	4763	4863	2-Dr. Brougham Sedan	6
4165	—	—	—	—	Bus. Coupe Special	3
4167	—	—	—	—	4-Dr. Sedan Slipstream Special	6
4168	4268	4668	4768	4868	4-Dr. Sedan Slipstream Delux	6
4169	4269	4669	—	—	2-Dr. Sedan Slipstream Special	6
—	—	—	—	4870	4-Dr. Sedan Trunk Custom	6
—	—	—	—	4871	Cabriolet Custom	6
—	—	—	—	4873	2-Dr. Brougham Custom	6
—	—	—	—	4878	4-Dr. Sedan Slipstream Custom	6
80 Series						
4180	4280				4-Dr. Sedan Trunk	6
4181	—				All Purpose Cabriolet	5
—	4282				Bus. Coupe	3
4183	4283				2-Dr. Sedan Brougham	6
4187	—				4-Dr. Sedan Slipstream Special	6
4188	4288				4-Dr. Sedan Slipstream Delux	6
—	4289				2-Dr. Sedan Slipstream	6

SERVICE AND SERIAL NUMBERS

YEAR SERIES	FIRST SERIAL NUMBER	FIRST SERVICE NUMBER
40 Series		
4140	K-5001	N4-5001
4240	K-56001	N4-55501
4640	K-77701	N4-78001
4740	K-136001	Discontinued
4840	K-196901	
60 Series		
4160	R-353001	N6-45001
4260	R-384001	N6-76001
4660	R-393101	N6-86001
4760	R-429201	Discontinued
4860	R-468501	
80 Series		
4180	B-110001	N8-17001
4280	B-114001	N8-21001

Nash

TECHNICAL MANUAL

For the

FOLLOWING YEARS

☆

41-42-46-47

OF THE (600) 40 SERIES

☆

41-42-46-47

OF THE (AMBASSADOR)
60 SERIES

☆

41-42

OF THE (AMBASSADOR)
80 SERIES

☆

Nash Motors

DIVISION OF NASH-KELVINATOR CORP.
DETROIT, MICHIGAN, U.S.A.

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15.000 to 15.999

BODY
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REAR AXLE SECTION

Nash

TECHNICAL HANDBOOK

DIAGNOSING AXLE TROUBLES 3

DISASSEMBLING NASH REAR AXLES 5

- Removing the Axle 5
- Setting Up the Axle 5
- Pulling the Hubs 5
- Removing the Brake Backing Plates 6
- Pulling the Axle Shafts 6
- Inspecting the Axle Housing 6
- Removing the Differential 7
- Pulling the Differential Side Bearings 8
- Removing the Ring Gear 8
- Removing the Spider Gear and Shaft 8
- Inspecting Differential Parts 9
- Removing the Pinion Gear and Shaft 9
- Pulling the Pinion Bearing and Adjusting Washer 10
- Inspecting the Pinion Gear and Shaft Assembly 11
- Cleaning Parts 11

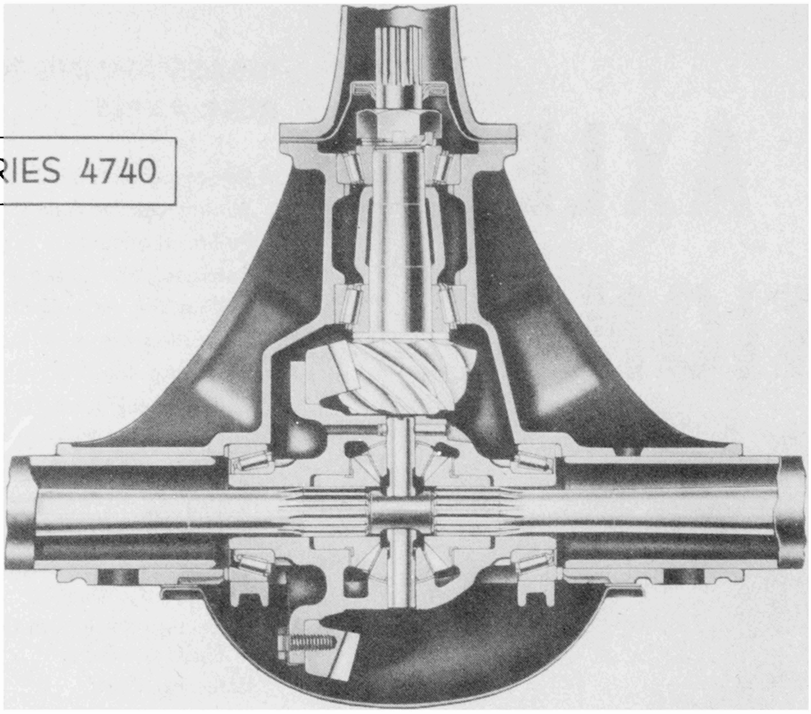
ASSEMBLING NASH REAR AXLES 11

- Assembling the Differential 11
- Replacing the Differential Side Bearings 12
- Adjusting the Side Bearings 12
- Installing the Ring Gear 13
- Installing the Pinion Gear and Shaft 13
- Pre-loading Pinion Bearings 15
- Testing Ring Gear and Pinion Backlash 16
- Pre-loading Differential Side Bearings 17
- Installing the Differential Assembly 18
- Inspecting Tooth Contact 18
- Replacing Axle Shaft Bearings 19
- Installing the Axle Shafts 19
- Installing the Brake Backing Plates 20
- Adjusting Axle Shaft End Play 20
- Installing the Wheel Hub 20
- Completing the Assembly 21
- Final Inspection 21

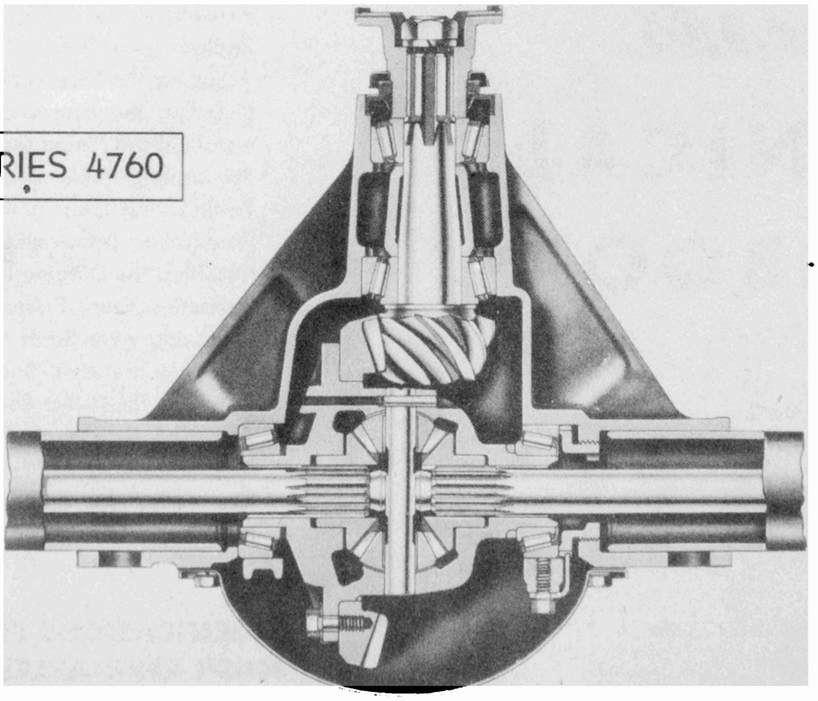
SPECIFICATIONS FOR NASH REAR AXLES 22

DIFFERENTIAL AND FINAL DRIVE GEARS

Nash Rear Axles



SERIES 4740



SERIES 4760

REAR AXLE SECTION
NASH TECHNICAL MANUAL

Basically, the rear axles of all Nash series are the same. Their design and construction are very similar. The principal differences in the different models lie in their size and the manner of adjustment.

Since 1940 the hypoid axle has been used on all series. In this type of axle, the pinion gear is mounted *below* the center line of the ring gear. The action of the pinion teeth as they contact the teeth of the ring gear is a sliding action which tends to wear the gears *in* rather than wear them *out*.

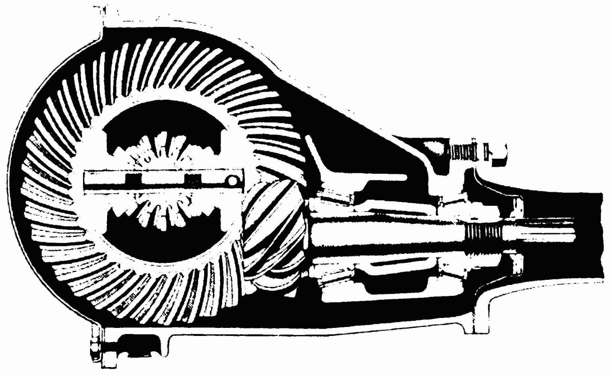


Figure 1—With hypoid gears, the pinion is mounted below the center line of the ring gear.

Hypoid construction has many advantages—making for longer wear and quieter operation. But to get the most out of it, it's important that only hypoid lubricants be used. These lubricants are specially processed to withstand the extremely heavy loads imposed by the sliding action of the gears.

In this manual, the procedure is given for a *complete* disassembly of the axle—down to its smallest component parts. Of course, in actual service there will probably be few or no axles that need complete disassembly. Your road test and inspection of parts will give you a pretty good idea of what needs to be done to any particular axle. And you will use only those portions of the disassembly procedure that are necessary to repair that unit.

For instance, if you find it necessary to replace the ring and pinion gears, that doesn't mean that you'll have to tear down the complete differential assembly.

Use only those parts of the procedure which are necessary to complete any given job.

DIAGNOSING AXLE TROUBLES

Many times owners bring cars into dealers' service departments for axle work. "That rear axle is noisy," they say. Actually, in a great many cases, the trouble is not in the axle at all. And the mechanic or service salesman who orders an axle overhaul on only the customer's say-so may be going into an expensive job that won't stop the noise.

To avoid needless expense of this kind a careful diagnosis of running gear complaints is necessary . . . and the road test is the one best way of making this diagnosis. Here's how . . .

First, pick out a smooth, black-top road where you can drive fifty miles an hour or faster. Then put the car through these four tests. If the car is equipped with an overdrive it should be locked out for these tests.

Test No. 1

With the engine warmed up, drive along at ten miles an hour. Listen carefully and keep driving at this speed until you are thoroughly familiar with all the car's noises.

Now gradually increase the speed until you reach forty-five miles an hour. As the car is gaining speed notice any changes in the running gear noises—notice the speed at which each noise comes in and goes out.

Then lift your foot from the accelerator and, without using the brakes, allow the car to slow down. Again, make a note of every change in sound and the speed at which each change takes place.

You'll probably find that every sound comes in and leaves at the same speeds on both acceleration and deceleration.

Test No. 2

Step the car up to fifty miles an hour, shift into neutral, turn off the ignition, and allow the car to coast until it comes to a stop. Listen again to all the running noises. You'll notice that at very low speeds a low pitched sound will come in. This is tire noise—not axle noise.

While making this test, note again all the changes in running noise and the speeds at which they come in and go out. Any of the noises you noted in Test No. 1 which also appear in Test No. 2 can be eliminated as axle noise, because, on this test, the axle is not under load and will produce no noise other than bearing noise.

If, however, there are any noises which appeared in the first test but did *not* appear in the second test, they may be in the rear axle. To find out make Test No. 3.

Test No. 3

Park the car with the engine running and apply the parking brakes. Then slowly accelerate the engine, comparing again all noises with those heard in the previous tests. Any sounds still left from Test No. 1 which are heard in this test can be disregarded. They are probably muffler, air cleaner, or body vibrations.

Test No. 4

Finally, put the car on a hoist, put it in gear and run the engine. Now analyze the noises you haven't eliminated to see if they actually come from the rear axle.

Noises to Watch for and What to Do About Them

Hum While Pulling

1. Inspect adjustment of bearings in axle shafts, pinion shaft or differential.
2. Inspect tooth contact between ring gear and pinion. (Refer to page 18 for correct procedure for determining tooth contact.)

Hum While Coasting

1. Inspect condition of rear axle wheel bearings.
2. Inspect pinion gear depth. Pinion may need to be moved away from ring gear . . . or toward ring gear.

Thumping

1. Inspect for chipped gear teeth, chipped bearing races or rollers, or a piece of metal imbedded in the gears.

Excessive Backlash

This may or may not be due to the rear axle. Other causes of backlash may be:

- A badly tuned engine
- A loose clutch disc
- Excessive play in transmission gears and shafts
- Loose universal joint flanges or trunnions.

If backlash proves to be in the rear axle these are the things to do:

1. Inspect for wheel hubs loose on the axle shafts.
2. Inspect for loose spring U-bolts.
3. Inspect for too much play between ring gear and pinion.
4. Inspect for end play in the pinion shaft, caused by bearing failure as the result of improper lubrication.

Noise on Turns

1. Inspect for spider gears that are too tight on the spider shaft.
2. Inspect for a scored spider shaft.
3. Inspect for differential side gears that are too tight in the case.
4. Inspect for chipped, scuffed or otherwise damaged differential gears.
5. Inspect for excessive wear of differential gears and thrust washers.

DISASSEMBLING NASH REAR AXLES

REMOVING THE AXLE—All Series

Drain and Flush Rear Axle

Remove the plug at the bottom of the axle housing and allow the axle lubricant to drain from the axle housing.

There are axle flushing solutions on the market that can be placed in the axle housing. These solutions will clean all of the old lubricant from the housing and the gears. Time is saved in this operation because the parts are clean when they are removed so that an inspection can be made quickly.

Always replace the drain plug after the axle lube has been removed.

41-4260-80 and 46-4760 Series

First, raise and support the rear end of the frame and body. Disconnect the rear wheel brake cables at the rear brake clevises. Disconnect the brake tubes at the brake backing plates. Disconnect the rear universal joint at the companion flange. Remove the U-bolts that hold the axle to the springs. And roll the axle assembly out from under the car.

41-42-46-4740 Series

Raise and support the rear end of the body. Disconnect the rear brake cable at the center equalizer. Disconnect the torque tube at the rear of the transmission . . . and the rear stabilizer bar at the rear axle. Remove the brake tubes at the brake backing plates. Disconnect the shock absorber rod (bayonet) at the axle end, permitting it to hang from the body; in doing this be careful not to bend the rod. Roll the axle free of the car. Then disconnect the torque tube and propeller shaft from the axle housing.

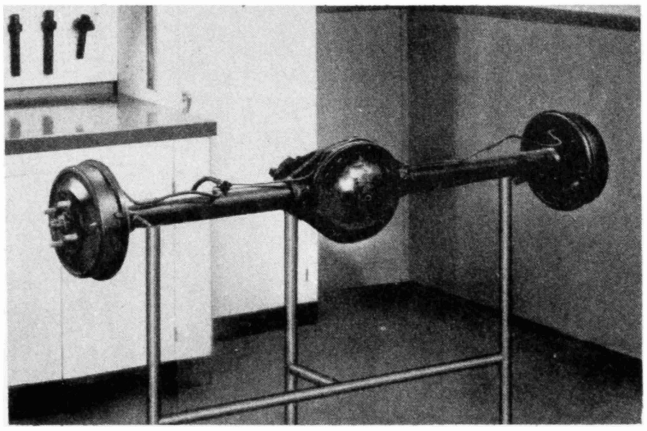


Figure 2—To simplify your work, set up the axle in an axle stand.

SETTING UP THE AXLE—All Series

When the axle is completely disconnected from the car, set it up in an axle stand where it can be worked on from all sides and where it can be fastened securely so it won't wobble. Then go ahead and disassemble it.

PULLING THE HUBS—All Series

First, remove the cotter keys and the rear axle nuts. Then attach the rear wheel hub puller (Tool J-1644) as shown in Fig. 3 and pull the wheel hubs and drums. The 40 Series has left hand threaded nuts on the left wheel hub.

When pulling hubs, never use a knock-out on the end of the axle shaft. It may damage the wheel bearings or thrust block.

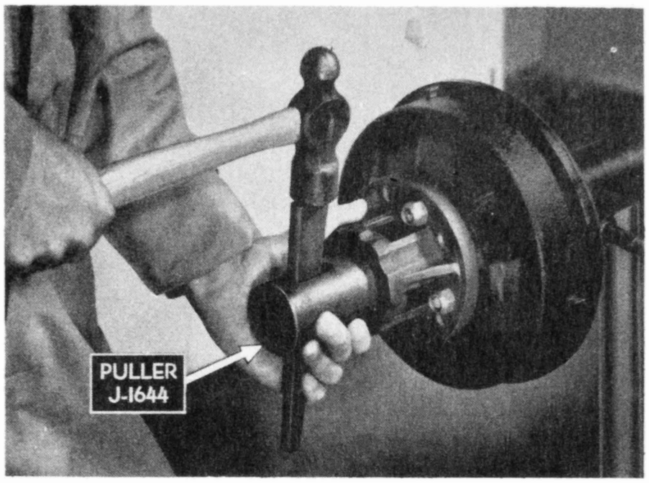


Figure 3—This puller removes rear wheel hubs easily and without danger of damaging internal axle parts.

As you remove the brake drums, examine them to see if they're scored or out of round. Look at the brake linings, too—just to be sure they're not worn and don't have any grease on them.

Then inspect the wheel hub for fit on the taper of the axle shaft. Inspect the key-way in the hub to be sure it's not burred by a loose hub . . . and try the key for fit in the key-ways, both in the hub and on the axle.

Then examine the taper of the axle shaft for bright spots. If you find any, it probably means that the car has been running for some time with a loose hub. In this case, look closely at the axle shaft, just outside the wheel bearing, for cracks.

Of course, any parts which you find damaged beyond repair must be replaced with new ones.

REMOVING THE BRAKE BACKING PLATES —All Series

Remove the cap screws that hold the brake support plate to the axle housing. Then slide the oil seal, spacer, backing plate and shims off the axle.

Caution: At this point inspect the oil seal to make sure that it has not been turning in the housing. An indication of oil leaking around the outside of the oil seal, is a sure sign that the seal is loose in the housing. Replace with a new seal and stake it into position.

Treat the shims with special care.

"Mike" them as you remove them so that you can put the same amount back in when you reassemble the axle.

Next inspect the backing plate to see if the cap screw holes have been elongated by loose holding bolts.

Discard the oil seal. (As a general rule, new oil seals should always be installed when assembling units of this type.)

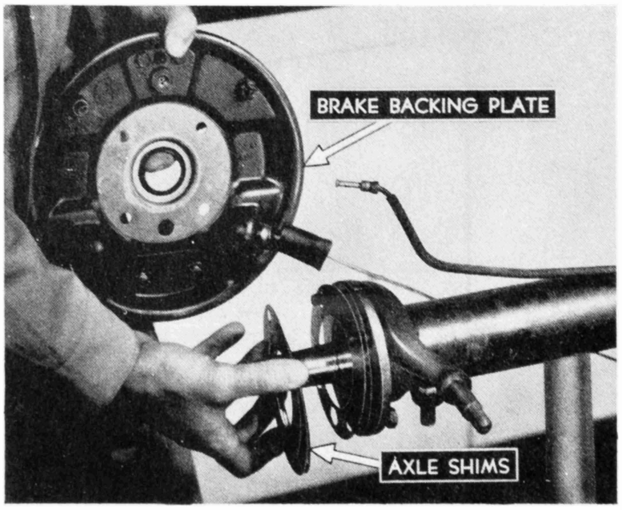


Figure 4—Removing the brake backing plate. Shims between the backing plate and the axle housing control axle end-play.

PULLING THE AXLE SHAFTS—All Series

Attach the special axle shaft puller (Tool J-2498) to the axle as shown in Fig. 5 and pull out the axle shaft and bearing. Then slip the bearing cup off the shaft.

The bearing cone and roller assembly is a tight, press fit on the axle shaft and must be removed in an arbor press (as shown in Fig. 6).

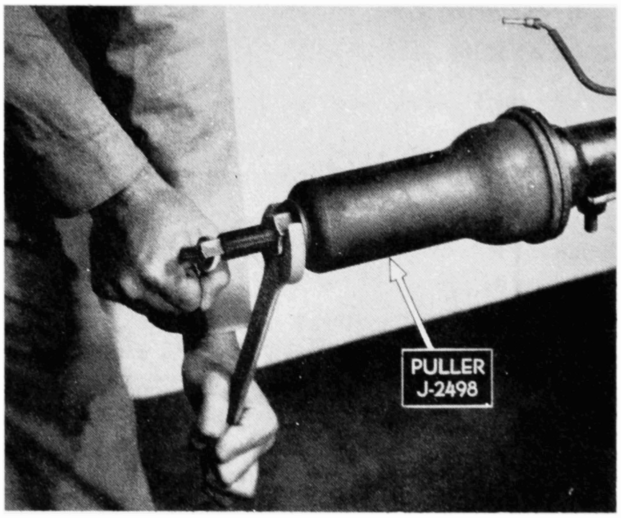


Figure 5—A special puller is used to remove the axle shafts from the axle housing.

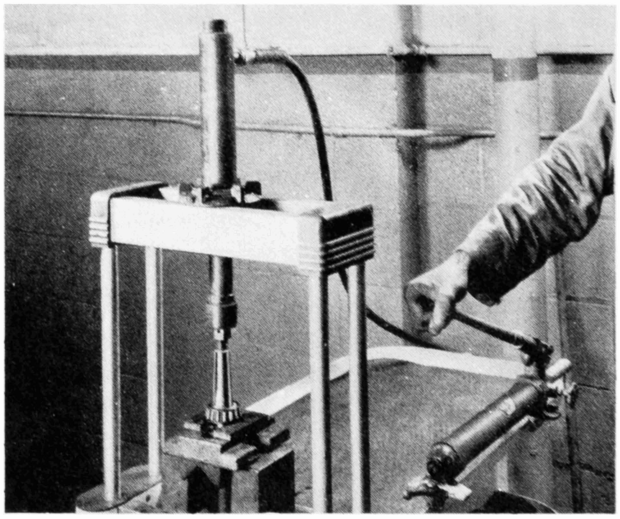


Figure 6—An arbor press like this should be used to remove wheel bearings from axle shafts.

INSPECTING THE AXLE HOUSING— All Series

A bent axle or housing may put an excessive strain on axle parts and make the whole axle noisy. It is, therefore, important to inspect the axle housing for straightness.

To do this, place two straight-edges across the flanges of the housing (Fig. 7) and measure the distances between their ends. If the straight-edges are parallel within limits of 1 16″ to 3 32″ at a distance of 11″ from the tube center, the housing is serviceable. Be sure and make this inspection two ways—horizontally, as shown in Fig. 7 . . . and vertically, to test for a sagged housing.

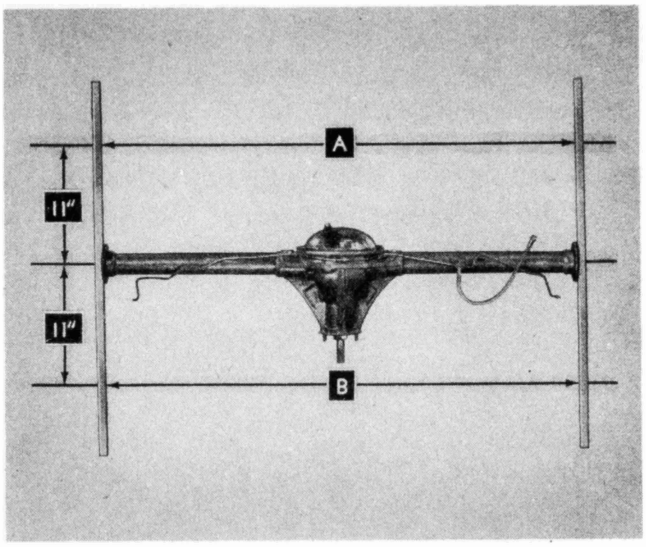


Figure 7—The setup for checking the axle housing. Dimensions "A" and "B" should be equal within 1/16" to 3/32".

REMOVING THE DIFFERENTIAL— All Series

Remove the differential cover bolts. As you do this, notice the ratio tag which is held on by one of these bolts. Save this tag and be sure to put it back when you reassemble the axle. It gives the gear ratio between ring and pinion and should remain with the axle unless a new set of gears with a different ratio is installed.

Where axle ratios are to be changed in new cars for use in mountainous regions, the ring gear and pinion received from the factory will have a tag stamped with the axle ratio. This tag must be attached to the axle housing, by using one of the cover cap screws.

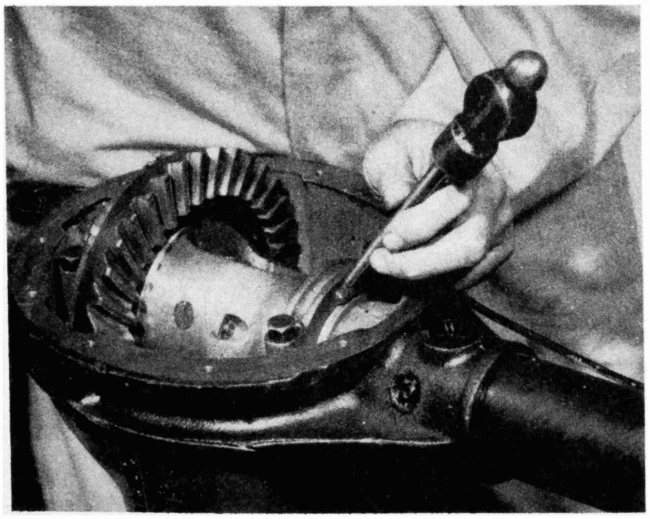


Figure 8—Marking the bearing caps before removing the differential.

Before removing the differential from the housing, take a center punch and mark the bearing caps so they can be put back in exactly the same positions.

41-42-46-4740 Series

First take out the bearing cap screws and remove the bearing caps.

Because the differential assembly is wedged, or "loaded" into the housing by shims placed at either side bearing, it is necessary to pry the assembly out of the case. Stick two bars into the case, as shown in Fig. 9, and lift it out by prying against the housing.

As the differential comes out of the housing, be careful not to damage the bearing cups and rollers and the shims.

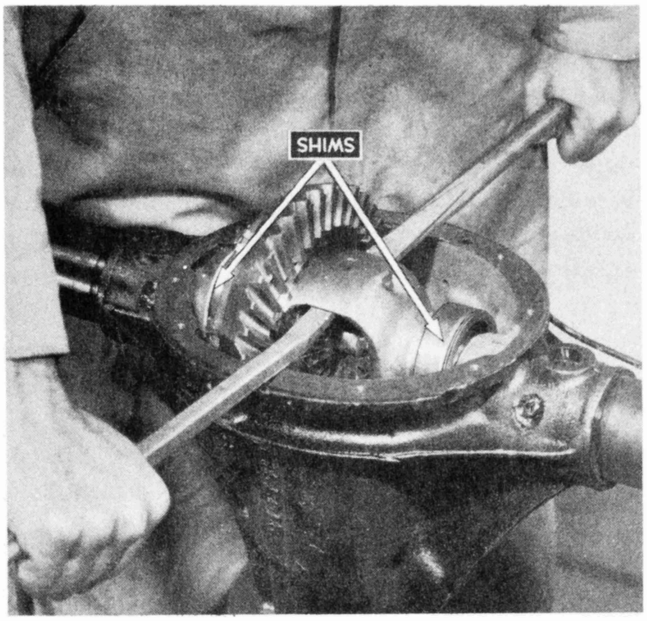


Figure 9—On the 40 Series it's necessary to pry the differential out of the axle housing.

When the assembly is out of the housing, "mike" each shim—then tie it to the bearing cap and the cup so they won't be misplaced.

41-4260-80 and 46-4760 Series

On these models, the differential assembly is "loaded" into the housing by shims at the left side bearing and an adjusting nut at the right.

To remove the assembly, remove the adjusting nut lock. Take off the bearing caps. Then loosen the adjusting nut until the differential can be removed from the housing.

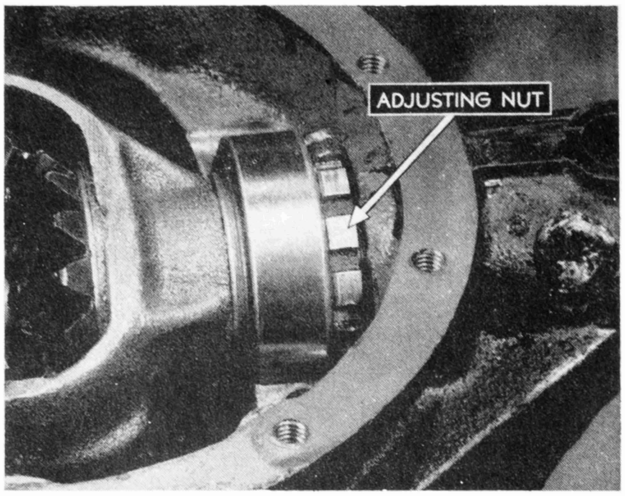


Figure 10—This adjusting nut "loads" the side bearings on the 60 Series models. It must be loosened before the assembly can be removed.

PULLING THE DIFFERENTIAL SIDE BEARINGS—All Series

A special tool (J-2497) is used to take the side bearing cones off the differentials of both 40 and 60 series. When using this tool (Fig. 11) be sure it pulls on the bearing so that the rollers are free. If the puller bears on the roller cage, it may damage the bearing.

41-4260-80 and 46-4760 Series

On the 60 Series you will notice that there are shims between the bearing and the case on the left side. When using the puller, be careful not to damage these shims; or, if you can't avoid damaging them, mike the shims, throw them away, and replace them with new shims of the same thickness.

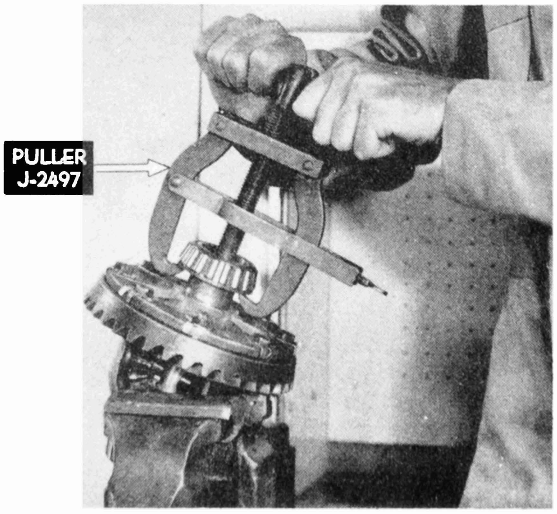


Figure 11—Pulling differential side bearing with Tool J-2497.

REMOVING THE RING GEAR—All Series

Take out the eight cap screws that hold the ring gear to the differential case. (It's a good idea to mark the ring gear and case so they can be reassembled in the same position.) Then take a brass drift and tap the gear off the case, being careful not to knick the face plate or drop the gear. *CAUTION: Do not use a chisel to wedge the ring gear from the case.*

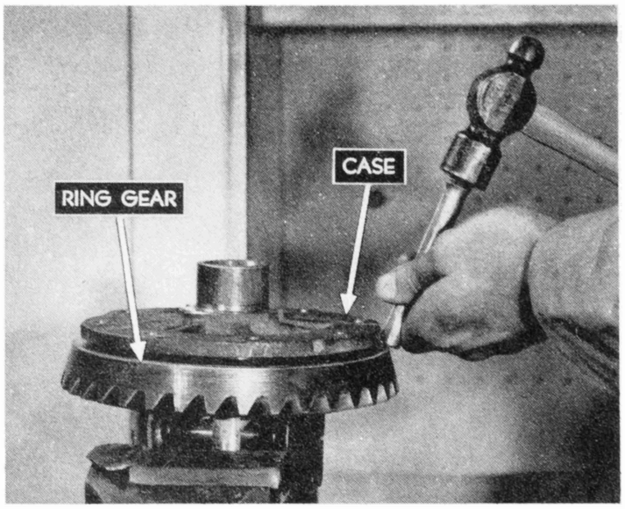


Figure 12—The ring gear should be tapped off the differential case with a brass drift.

REMOVING THE SPIDER GEAR AND SHAFT—All Series

Take a long taper or drift and drive out the lockpin that holds the spider shaft in place. Drive the pin out from left to right as in Fig. 13.

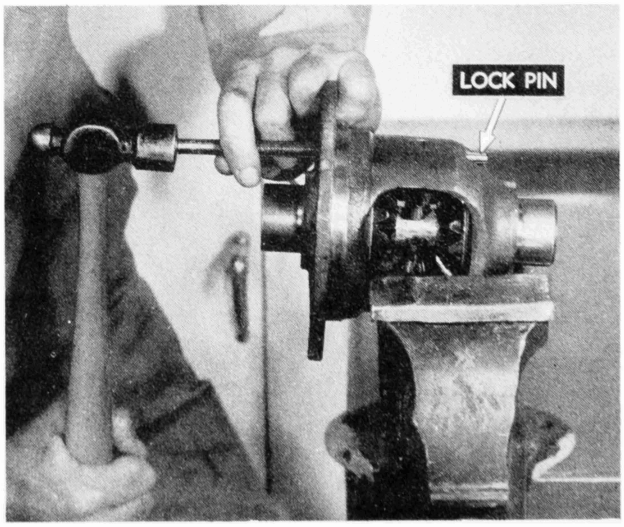


Figure 13—The spider gear lockpin must be driven out before the spider gears and shaft can be removed.

Then the spider shaft can be driven out and the thrust block can be dropped out through the differential side gear. Roll the spider gears around on the side gears until they can be lifted out through the holes in the case. Then lift the side gears and their thrust washers out. (Mark these gears so you can replace them just the way you found them.)

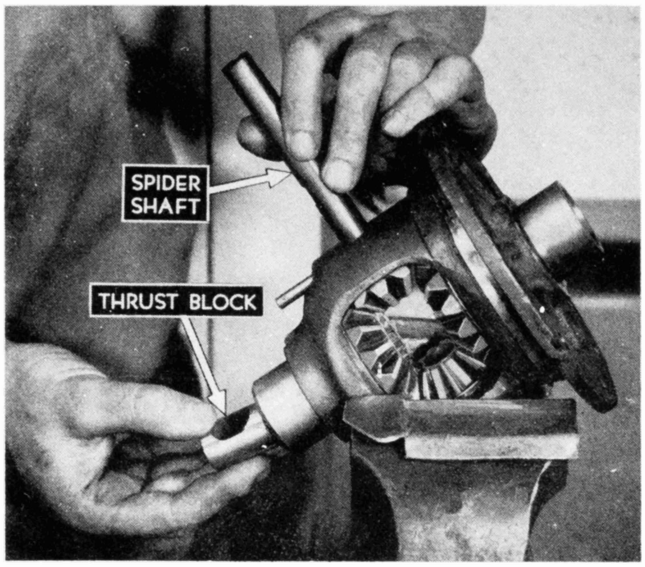


Figure 14—When the spider shaft and thrust block have been removed, the spider and side gears can be lifted out.

INSPECTING DIFFERENTIAL PARTS— All Series

The Spider Gear Shaft

Whenever one rear wheel is stuck and the other is spinning, the spider shaft is subjected to excessive strain. Inspect this shaft for scoring or other signs of wear.

Thrust Block

Examine the thrust block to see that it has not been crushed or broken. A thrust block that has been damaged or distorted will affect the end play of the axle shafts. If used in this condition, excessive end play of the axle shaft will result.

The Spider Gears

Examine the teeth of these gears for excessive wear or chipping. Fit a new spider gear shaft into the gear to see if the hole is out of round or worn. Discard the thrust washers—new ones will be used during assembly.

The Differential Side Gears

Examine these gears, too, for worn, cracked or chipped teeth. Fit the gear onto the axle spline to see if it fits tightly. If there is any play, try the gear on a new axle shaft to determine whether the wear is in the gear or the shaft. This play must be corrected or it will cause excessive backlash in the drive line. If the gears need replacement, remember that spider and side gears should be replaced as a set.

The Differential Case

Examine the bearing surfaces in the differential case to be sure they are not scored or grooved.

The Ring Gear

Inspect all the teeth of this gear for wear, cracking or chipping. Then examine the tooth contact pattern (See page 19) to see if the gear has been meshing correctly with the pinion gear.

If the tooth pattern indicates that the ring and pinion have not been meshing correctly, both gears should be replaced, because it is impossible to adjust worn gears for quiet operation.

If you must replace either the ring gear or the pinion gear—always replace both gears. These gears are run in and lapped altogether at the factory as a matched set.

REMOVING THE PINION GEAR AND SHAFT

41-42-46-4740 Series

Remove the oil seal, bend back the lip of the pinion nut lock, and remove the pinion nut. This can be done by holding the pinion shaft with the pinion holding tool and spacer (Tool J-2496)—then breaking the nut loose with a wrench.

After the pinion nut is removed, tap the end of the pinion shaft lightly with a fiber hammer to free the front bearing cone from the cup—then remove the bearing. Between the bearing and the bearing spacer there are a number of shims. Be sure to get all these shims out and "mike" them. Then tie them to the bearing.

Then remove the pinion gear, shaft, bearing and spacer as a unit from the rear of the housing.

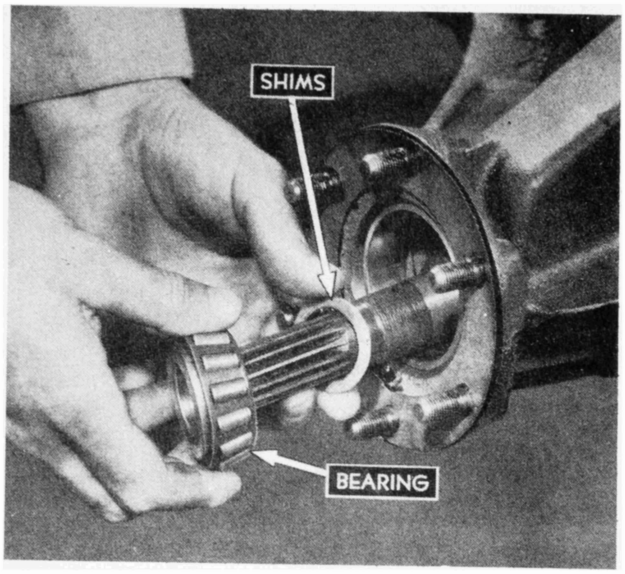


Figure 15—Before removing the pinion shaft, remove the pinion nut, front bearing and shims.

41-4260-80 and 46-4760 Series

First, remove the pinion shaft nut, using pinion shaft nut socket tool (J-1411) while holding the companion flange as shown in Fig. 16.

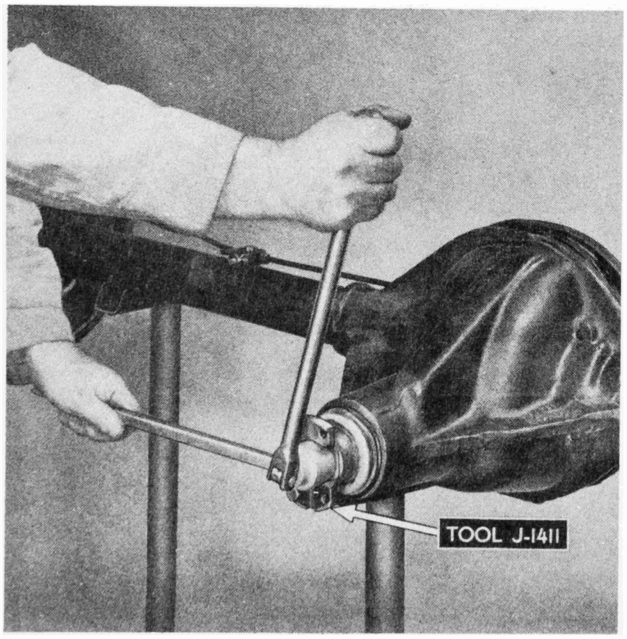


Figure 16—Special tools make it easy to remove the pinion shaft nut from 60 Series axles.

Next, remove the companion flange. This is a press fit and you'll need to use puller J-1412 as shown in Fig. 17.

Do not drive the companion flange off the shaft.

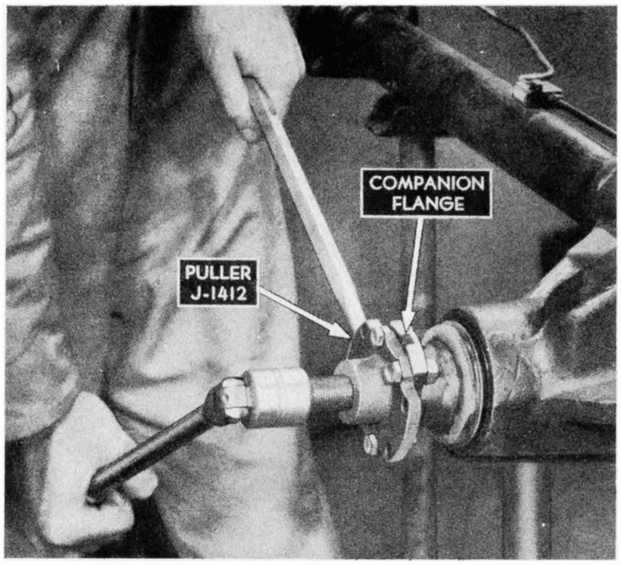


Figure 17—To prevent damage to differential parts always use Tool J-1412 to pull the companion flange.

After the companion flange has been removed, take out the pinion oil seal. This seal will be damaged during removal so discard it and use a new one during reassembly.

Then tap the end of the pinion shaft with a fiber hammer just enough to loosen the front pinion bearing. Remove this bearing and the adjusting shims behind it. "Mike" the shims and tie them to the bearing for use during reassembly.

Finally, remove the pinion gear, shaft and rear bearing from the rear of the housing.

Pinion Bearing Cups—All Series

There is a recess behind each pinion bearing cup that will allow it to be driven from the case. Use a long punch to drive the cups from the case. To keep from damaging the cups as they are removed, drive them out first on one side then on the other, keeping them square in the bores.

PULLING THE PINION BEARING AND ADJUSTING WASHER—All Series

The pinion bearing is a press fit on the pinion shaft. To remove it, attach the pinion bearing puller (Tool J-2244 for the 40 Series and Tool J-2245 for the 60 Series) as in Fig. 18 and remove it. At the same time remove the pinion bearing adjusting washer which is between the bearing and the gear and which regulates the depth of the pinion in the housing. Fasten the adjusting washer to the bearing for assembly.

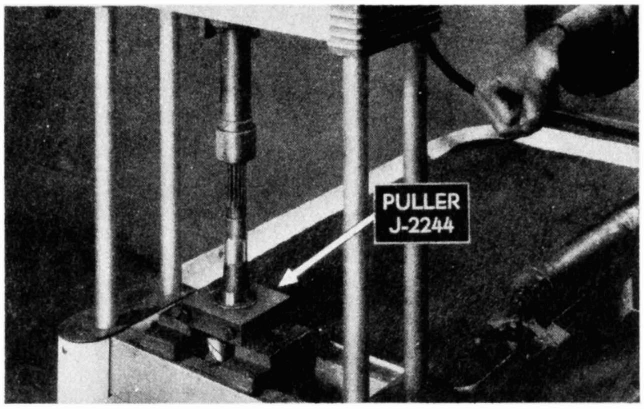


Figure 18—Special pullers are used to take pinion bearings off pinion shafts.

INSPECTING THE PINION GEAR AND SHAFT ASSEMBLY—All Series

Pinion and Ring Gears

Inspect the pinion and ring gears to be sure they're matched sets. On the rear face of the pinion gear and the edge of the ring gear there are marks or numbers (Fig. 19). The prefix marking should be the same on both gears. New gears out of stock should be inspected the same way. Then inspect the pinion gear for worn, chipped or cracked teeth (remembering that if either the pinion or the ring gear needs replacement, both gears must be replaced as a set.)

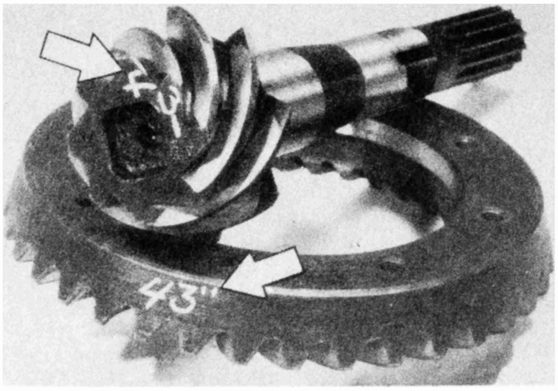


Figure 19—Marks on ring and pinion gears indicate that they are a perfect matched set. These gears should always be replaced as a set.

Pinion Bearings

Inspect both pinion bearings — cones, cups and rollers—for excessive wear, overheating or scoring. Replace them if necessary.

CLEANING PARTS—All Series

Before starting to reassemble the axle all parts should be thoroughly washed and cleaned with an approved cleaning solution. However, do *not* lubricate any bearings until after the axle has been assembled and all adjustments have been made. The specifications for these axles have been set up on the basis of dry parts, and lubrication will make your adjustments inaccurate. If you are not going to reassemble the parts immediately, be sure to cover them as protection against dust after you've cleaned them.

ASSEMBLING NASH REAR AXLES

ASSEMBLING THE DIFFERENTIAL—All Series

Side Gears

Using *new* thrust washers behind the side gears (the side with the oil pockets toward the gear), install the gears in the ends of the differential case, assembling the gears according to the marks you made when disassembling the unit (page 9). Lubricate the thrust bearing surfaces with heavy engine oil, and rotate the gears to be sure they turn without any binding.

Thrust Washers

The thrust washers used are pitted on one side to pocket lubrication. This side of the washer goes toward the gear as it is installed.

Spider Gears

Install new thrust washers behind the spider gears and mesh them with the side gears so that they are directly opposite each other in the case (Fig. 20). Then roll the gear assembly around in the case till the holes in the spider gears line up with the holes in the case for the spider shaft. Check to be sure your marks are correct so that parts are replaced in the same position as they were before you removed them.

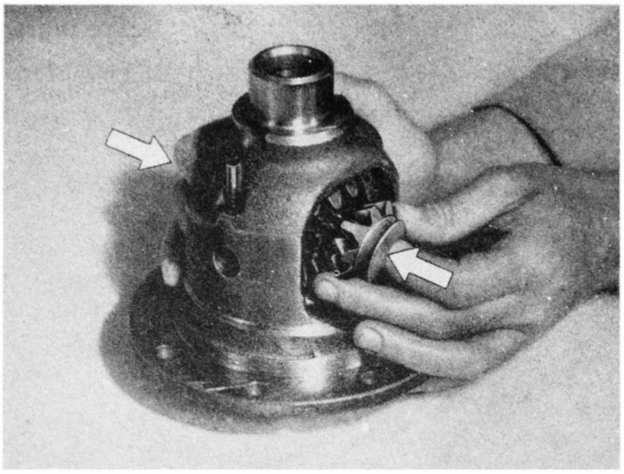


Figure 20—With the side gears in place, the spider gears are installed exactly opposite each other.

Spider Gear Shaft

Fit the spider gear shaft in so that the lock pin hole in the shaft lines up with the hole in the case. Then drive the lock pin into place.

REPLACING THE DIFFERENTIAL SIDE BEARINGS

41-42-46-4740 Series

Be sure the bearing surfaces are clean. Then, with Tool J-2100, press the bearings onto the case (using your marks for correct position).

Be sure the bearings are pressed all the way on — tight against the shoulder of the case.

41-4260-80 and 46-4760 Series

Using the bearing replacing tool (J-2104) press the side bearings onto the case just as above. In this case, however, be sure the same number of shims are replaced behind the *left* bearing as were there when you disassembled the unit. Place the thickest shim against the case. On the right side there are no shims. Just press this bearing tight up against the shoulder of the case.

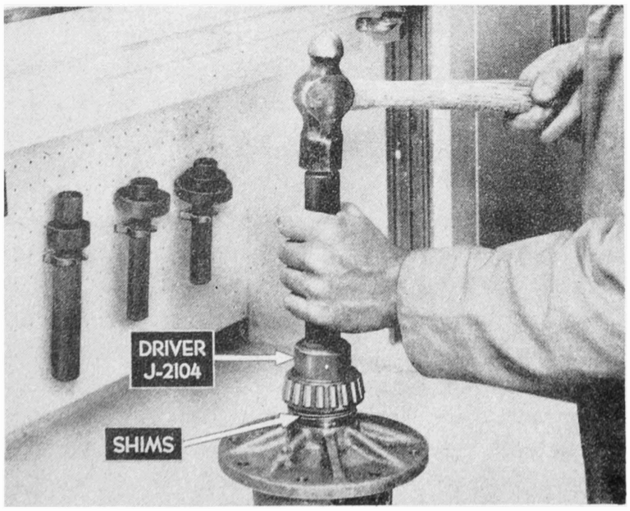


Figure 21—Using Tool J-2104 to replace differential side bearings on 60 Series. Shims are installed behind left bearing only.

ADJUSTING THE SIDE BEARINGS— All Series

Place the bearing cup over each side bearing. Rotate the bearing to seat the rollers in the cups. Then place the entire assembly in the axle housing.

41-42-46-4740 Series

On each side, between the bearing and the case, install a .075″ shim. Then test the assembly for end-play. If there is any end-play, remove the shims and use the next thickness, being sure to use the same thickness on each side. These shims are graduated in units of .005″. Starting at .075″ they are available in thicknesses of .080″, .085″, .090″ and .095″.

All Series

When end play has been eliminated, place the bearing caps in position (going by your marks) and tighten the cap screws with a torque wrench (55-60 foot-pounds on 40 Series—110 foot-pounds on 60).

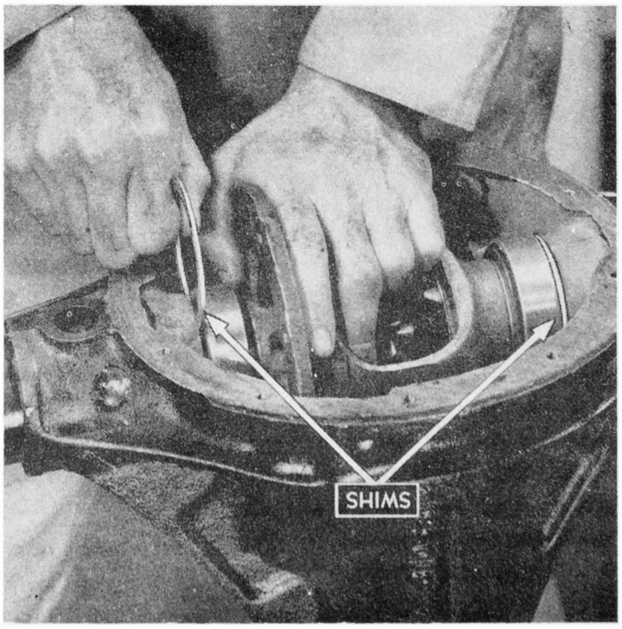


Figure 22—End play and ring gear adjustment on the 40 Series are controlled by shims placed at each side bearing.

Now rotate the differential assembly to see that there is no end play or binding.

Next, with the assembly still in place, attach a dial indicator to the housing with the button on the ring gear face of the differential case. Rotate the assembly and test the ring gear face for run-out. The run-out should not be over .002″.

Remove the case from the housing, being careful to retain the shims you have put into each side bearing to remove end play.

INSTALLING THE RING GEAR—All Series

With the differential out of the housing, put the ring gear over the ring gear face. If you're using the same gear you removed, be sure you put it back in the same position according to your marks. Finally, bolt the ring gear to the face with cap screws and *new* locks. Two of the screws inserted in opposite holes may be used as guides to pull the gear into position.

Tighten the cap screws with a torque wrench as follows: 40 Series—45 to 50 foot-pounds; 60 and 80 Series—60-65 foot-pounds.

INSTALLING THE PINION GEAR AND SHAFT—All Series

Bearing Cups

If the bearing cups were removed during disassembly, drive them back into place with a pinion bearing cup replacing tool (J-2534 for the 40 and J-2533 for the 60). Both bearing cups should be replaced so that the wide mouth of the taper is outward. Drive them *straight* into *clean* holes.

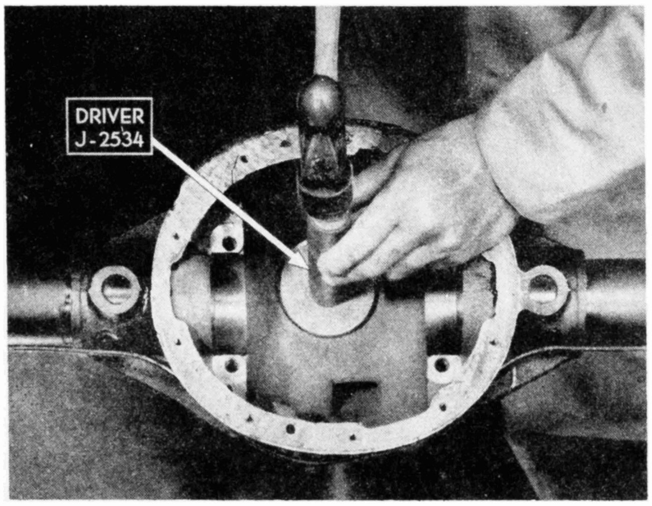


Figure 23—Special drivers are used to position pinion bearing cups. The front cup faces toward the front—the rear cup toward the rear.

Pinion Depth Adjustment

Tolerances are required in machining any part, and each part, as it's finished will be machined within a high and a low limit. To compensate for these manufacturing tolerances, pinion and ring gears are tested for tooth contact and quietness at a standard cone setting.

Some pinions may vary from this standard cone setting, and, during factory testing, the amount of this variation is etched on the rear face of the pinion gear (Fig. 24). The gear is marked plus or minus the number of thousandths that the gear is above or below standard. Plus means that the gear is too close to the center line of the axle, and minus means it's too far away.

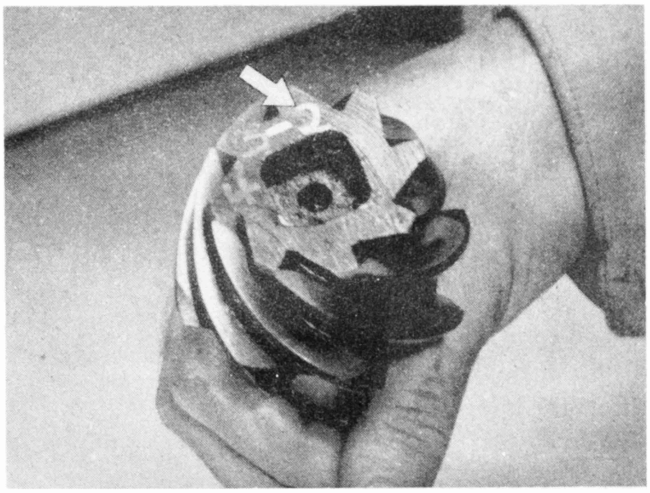


Figure 24—Inspection marks indicate how much pinion gear depth varies from standard. Marks show that this gear is .002″ too far from the ring gear. To compensate, a depth washer .002″ more than standard would be installed.

Therefore, if you're reinstalling the same pinion shaft and bearing as you removed, use the same adjusting washer. If, however, you're using a new ring and pinion set or bearing, use a new adjusting washer. Here's how you determine the size of that washer.

Method No. 1

Note the inspection marks on the old and new pinion gears, and "mike" the old depth washer. Compare the inspection mark on the new pinion with that on the old pinion and use a depth washer to compensate for the difference.

FOR EXAMPLE: If the old pinion is marked +2 and the new pinion is marked −3, there is a difference of .005″ away from the ring gear in these two pinions. Therefore, the new depth washer must be .005" thicker than the old one. If the old washer "mikes" .123", the new one should "mike" .128".

Method No. 2

The new Nash rear axle drive pinion gauge (Tool J-2499) makes selection of the right adjusting washer a positive process, regardless of whether you're using new or old parts or housing. Here's how you use it.

First, place the front pinion bearing cone in the bearing cup. Press the cone and revolve it to be sure the rollers are properly "set."

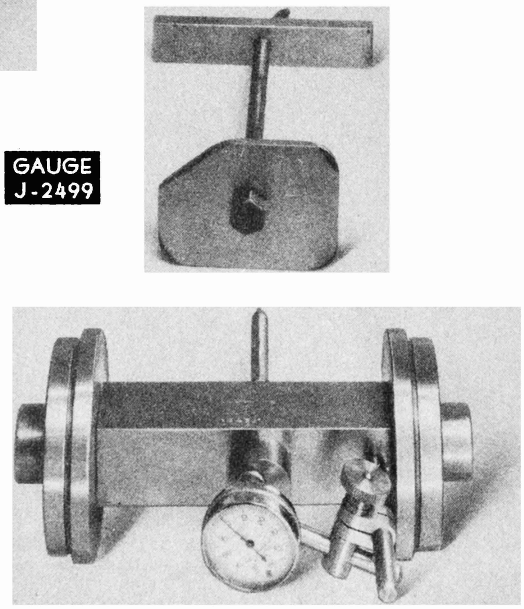


Figure 25—The new Nash rear axle drive pinion gauge makes accurate pinion depth adjustment easy.

Then bolt the gauge plate over the bearing, being sure that it does *not* touch the housing at any point. The bolt runs down through the bearing and is secured at the pinion end of the housing by a cross piece and thumb screw.

Attach a dial indicator to the tool as shown in Fig. 26, with the indicator button on the top of the gauge pin. Set the dial indicator—under tension—at zero.

Install the tool with the adapters squarely seated in the side bearing recesses in the housing.

These adapters slide easily on and off the body of the tool and are reversible. For the 40 Series use them with the small diameter outward. For the 60 Series use them with the large diameter outward.

Then swing the gauge point across the plate until the highest reading is obtained from the dial indicator. Subtracting this reading from a constant of .140" will give you the standard adjusting washer thickness for that housing.

Of course you'll have to adjust this figure according to the depth marking on the face of the pinion gear.

> FOR EXAMPLE: If when you swing the gauge point across the plate, you get a reading of .016", subtracting this figure from .140" will give you a standard of .124". That means that, using a standard "0" pinion, you'd need an adjusting washer of .124" thickness. If however your pinion marking reads "—2" (meaning that it's .002" undersize) you'd have to add this .002" to the standard. Thus, your adjusting washer would be .126".

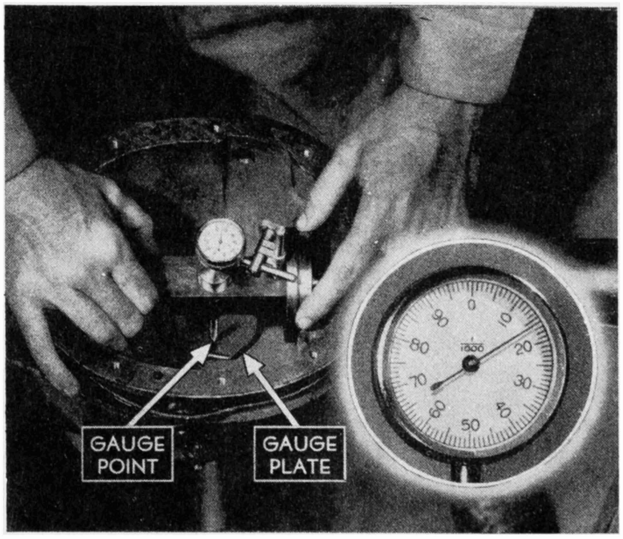


Figure 26—To find the standard pinion adjusting washer thickness for any axle housing, swing the gauge point across the plate and subtract the reading (.016" in this case) from .140". Standard for this housing is .124".

Bearing Installation

When the proper depth washer has been selected, slide it onto the shaft against the pinion gear. Then, using the pinion bearing replacing tool (J-1416), press the bearing tight against the washer and the gear. The large diameter of the bearing should be toward the gear. Tool J-1416 is not large enough to press on the 60 Series pinion bearing by itself. With this Series use the pinion bearing spacer as an adapter with the tool.

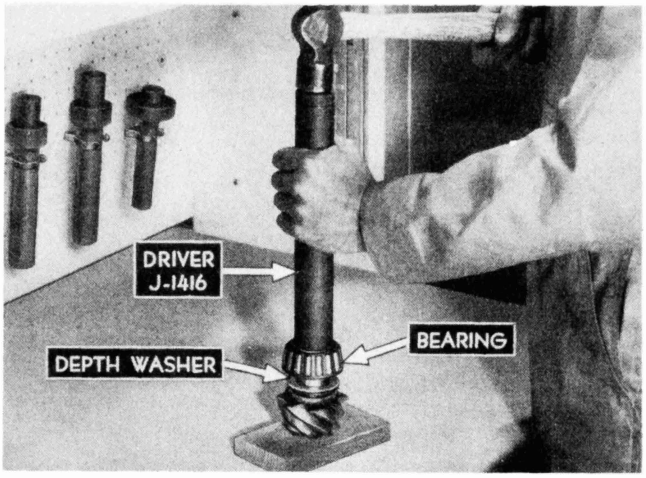


Figure 27—Tool J-1416 sets pinion bearing and depth washer tight against the pinion gear. On the 60 Series the pinion bearing spacer is used as an adapter.

Finally, slide the pinion shaft and gear assembly into the housing from the rear. Tap the gear lightly and rotate it to seat the rollers in the bearing cup.

PRE-LOADING PINION BEARINGS—All Series

To compensate for expansion of the housing under the heat of operating conditions, the pinion bearings must be pre-loaded about .003″ beyond the point where end play is eliminated.

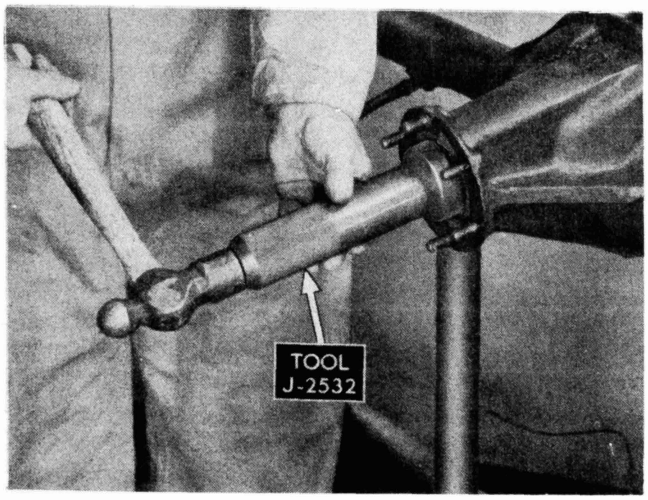


Figure 28—This bearing cup replacing tool makes quick work of positioning front bearing cups.

To do this, install the front bearing cup, using bearing cup replacing tool (J-2532 for the 40 Series and J-2531 for the 60 Series).

Then, install the pinion shaft assembly, sliding it in from the rear of the housing. From the front install the bearing spacer and the same number of shims as were removed on disassembly. Place the front bearing cone in position. Now you're ready to test the pre-loading of the bearings.

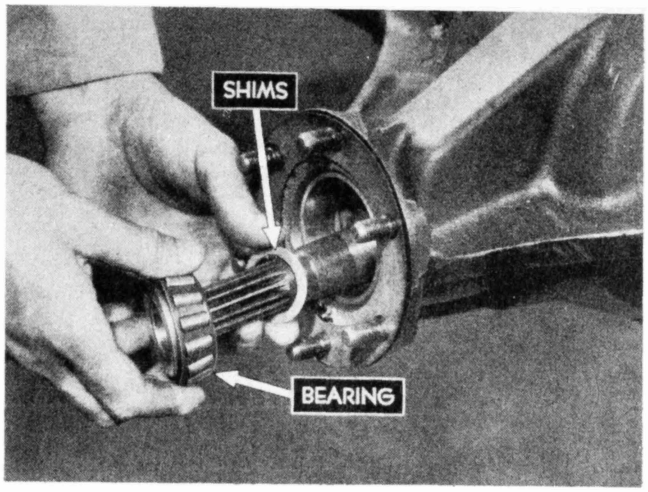


Figure 29—While sliding the pinion shaft in from the rear, insert the bearing and shims through the front of the axle housing.

41-42-46-4740 Series

On this series the bearing is held in position by the pinion nut and lock washer. Draw the nut up tight. Then test the number of *inch-pounds* needed to turn the shaft. If the bearings are properly loaded to .003″ it will take from 12 to 14 inch-pounds of pull.

If it takes more than 14 inch-pounds to turn the shaft, add shims between the bearing and the spacer. If the shaft turns on less than 12 inch-pounds, take shims out.

The pinion holding tool and spacer (J-2496) is used in combination with a spring scale to get inch-pound readings. (See Fig. 30). The tool is so designed that the splined ends are exactly 6 inches from the center of the handle. Therefore, by attaching the spring scale to the center of the handle, pulling the tool around, taking the reading in pounds from the scale and multiplying it by 6, you get the number of inch-pounds needed to turn the shaft. To eliminate the effect of gravity, turn the axle up so that you're pulling in a horizontal plane. In the example shown (Fig. 30) it requires 2½ pounds at 6 inches, or 15 inch-pounds to turn the shaft (within the limits for the 60 Series).

41-4260-80 and 46-4760 Series

To make pinion adjustment easy, Tool J-2496 is used in place of the companion flange and oil seal.

Slip the tool over the splined shaft, tighten the pinion nut and adjust the bearings the same as in the 40 Series until it takes from 15 to 18 inch-pounds to turn the pinion shaft.

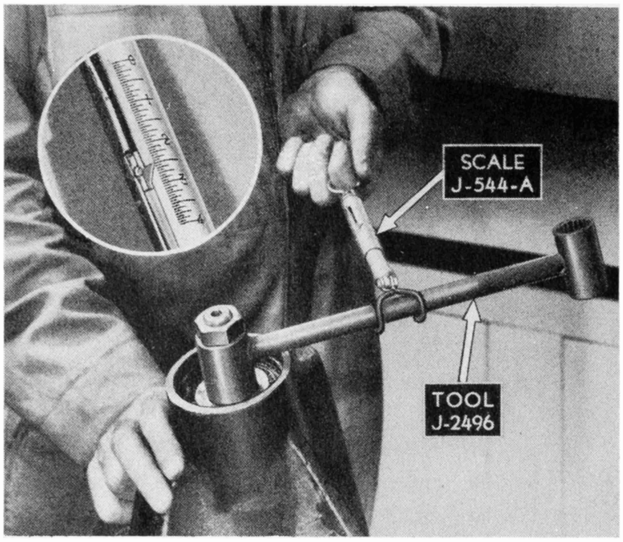


Figure 30—Tool J-2496, plus a spring scale, is used to test pinion bearing load. The above shaft requires 2½ pounds at 6 inches—15 inch-pounds — to turn it.

After the bearings are properly loaded, take out the spacing tool and install a *new* oil seal. Tool J-1556 is used for this operation, as shown in Fig. 31.

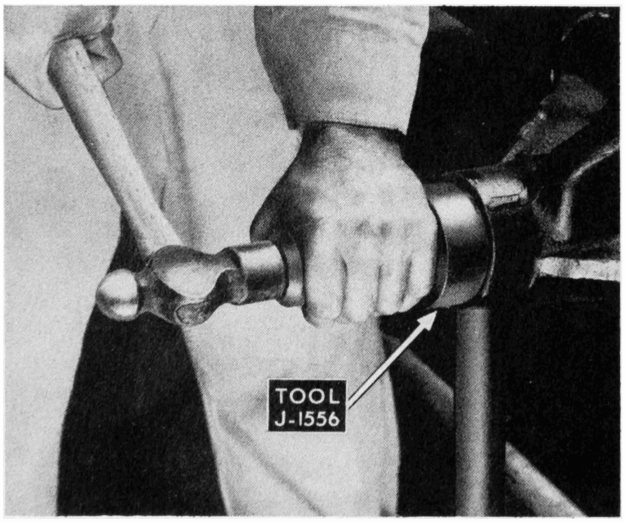


Figure 31—Always install a new pinion oil seal when reassembling an axle. A special tool installs the seal correctly.

Next, install the companion flange. Tool J-1375 (Fig. 32) makes quick, easy work of this operation.

Finally, put on the pinion nut and washer, and draw them up to 105 to 110 foot-pounds of pull.

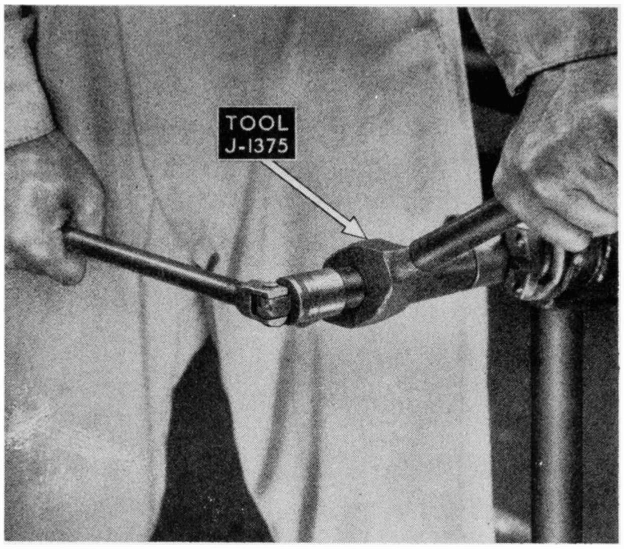


Figure 32—Tool J-1375 makes installation of the companion flange an easy task.

TESTING RING GEAR AND PINION BACKLASH

41-42-46-4740 Series

With the pinion in place, take the differential assembly with its side bearing shims (as determined on page 12) and install it in the housing, being sure that the bearings are seated in the cups. Attach a dial indicator to the housing with the button resting against one tooth of the ring gear and at right angles to it (Fig. 33). Now rock the ring gear back and forth to see how much it moves without moving the pinion. This backlash, as registered on the dial indicator, should be between .004″ and .006″.

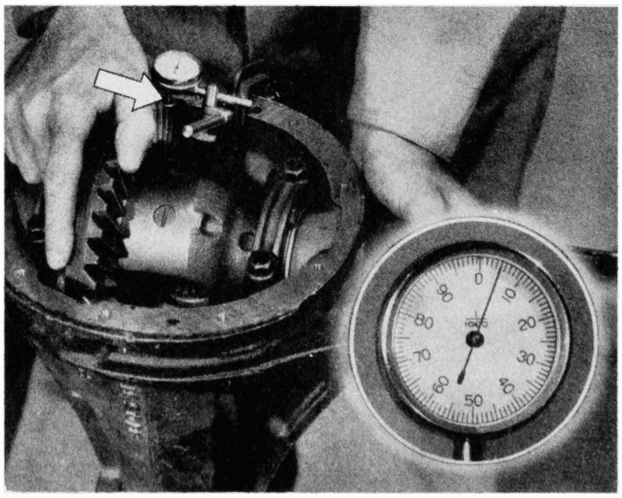


Figure 33—The set-up for testing ring and pinion backlash. The dial indicator button should rest on a tooth of the ring gear and at right angles to it.

If the backlash is not within the specified limits, the side bearing shims will have to be rearranged. Backlash can be increased by putting a thinner shim on the left side and a thicker shim on the right . . . or decreased by putting a thinner shim on the right and a thicker shim on the left.

> *Never change the total thickness of shims. If you decrease the thickness on one side, you must increase the thickness on the other side by the same amount.*

> FOR EXAMPLE: If the dial indicator shows backlash to be .011″, and if there are shims of .085″ at each side bearing, it would be necessary to remove .005″ from the right and add .005″ to the left in order to reduce backlash to the maximum allowable (.006″). To do this, you would replace the right shim with one of .080″ thickness and replace the left one with a shim of .090″ thickness. This would not affect your total of .170″ thickness of shims.

41-4260-80 and 46-4760 Series

With the pinion shaft installed and the pinion bearings pre-loaded (page 15), place the differential in the housing.

> *With this series there are shims between the left side bearing and the case. On the right there is an adjusting nut in the housing.*

Put on the bearing caps and tighten the cap screw just enough to start gripping the lock washer. Then tighten the adjusting nut on the right side of the carrier until a slight increase in tension is felt in the ring gear as you rotate it. Attach a dial indicator to the housing with the button touching one of the ring gear teeth at right angles (Fig. 33). Rotate the ring gear against the pinion and read the backlash on the dial indicator. It should be from .004″ to .006″.

If backlash is more than .006″, more shim will have to be placed between the left side bearing cone and the case. If backlash is less than .004″, less shim must be used.

These shims are available in .003″, .005″, .010″ and .030″ thicknesses and, used in different combinations, they enable you to adjust backlash within very fine limits.

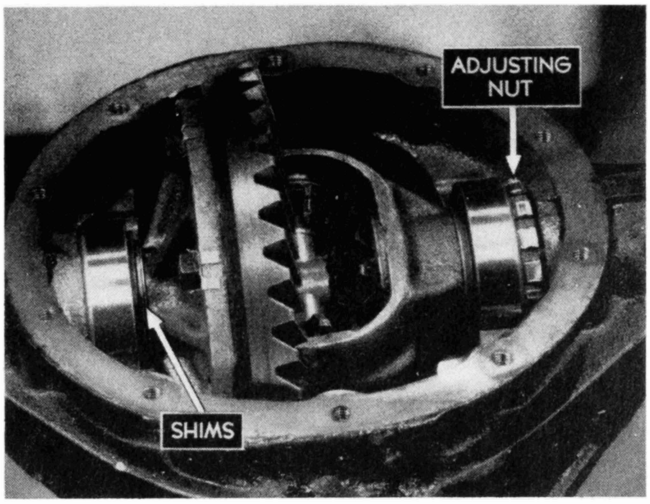


Figure 34—On the 60 Series backlash is adjusted by adding or removing shims at the left side bearing . . . then tightening the adjusting nut at the right.

PRE-LOADING DIFFERENTIAL SIDE BEARINGS—All Series

With backlash properly adjusted, re-test the differential assembly for end play (page 12). If no end play exists the side bearings are ready for pre-loading.

On assembly all rear axle bearings are pre-loaded to compensate for heat expansion. The differential side bearings should be pre-loaded to between a .004″ and .006″. This is the total loading for both side bearings.

41-42-46-4740 Series

Inasmuch as the available shims are graduated in units of .005″, the pre-loading cannot be divided equally between the two side bearings. This consideration has been allowed for in manufacturing, however, and the assembly is designed so that pre-loading may be done at one bearing.

Therefore, with all end play removed, all you need do to pre-load both bearings is remove the right hand shim and replace it with the next size larger.

> FOR EXAMPLE: In the example on this page end play was eliminated and backlash adjusted by using a .090″ shim on the left and an .080″ shim on the right. To pre-load these bearings, just replace the .080″ shim on the right with an .085″ shim.

Such an adjustment may affect slightly the backlash adjustment. However, the .002″ tolerance (.004″ to .006″) in backlash adjustment is enough to absorb the difference.

41-4260-80 and 46-4760 Series

With backlash and end play properly adjusted, tighten the adjusting nut at the right (with the bearing caps tightened to a slight tension) until the ring is just free to rotate. When a slight binding action is felt in the rotation of the ring gear, tighten the adjusting nut between one and two more notches. This will pre-load the bearings from .004″ to .006″.

To complete the installation, tighten the bearing cap screws with 105 to 110 foot-pounds of pull on a torque wrench. Re-test ring and pinion backlash with the dial indicator (as on page 17). And install the bearing adjusting nut lock so that the nut cannot slip out of adjustment.

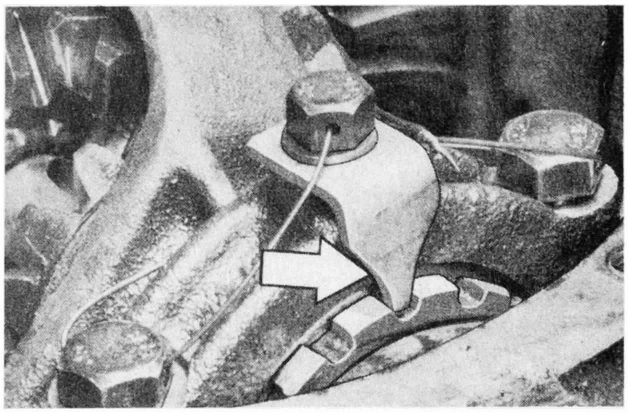


Figure 35—On the 60 Series, this bearing adjusting nut lock maintains the proper bearing load.

INSTALLING THE DIFFERENTIAL ASSEMBLY

41-42-46-4740 Series

When you have determined the correct number of shims for each side bearing, you're ready for final assembly of the differential. To do this, place the entire assembly, including shims and bearing cups in the opening of the housing. Tip the bearing cups out slightly and tap them down into the housing with a plastic hammer (as in Fig. 36).

When tapping the bearing cups into place, be careful not to distort or damage them in any way.

Finally, put on the bearing caps and tighten the cap screws with 55 to 60 foot-pounds of pull on a torque wrench. Tap the tops of the bearing caps with a sharp blow of a hammer to set the bearing rollers in the cups, and check again the ring and pinion backlash.

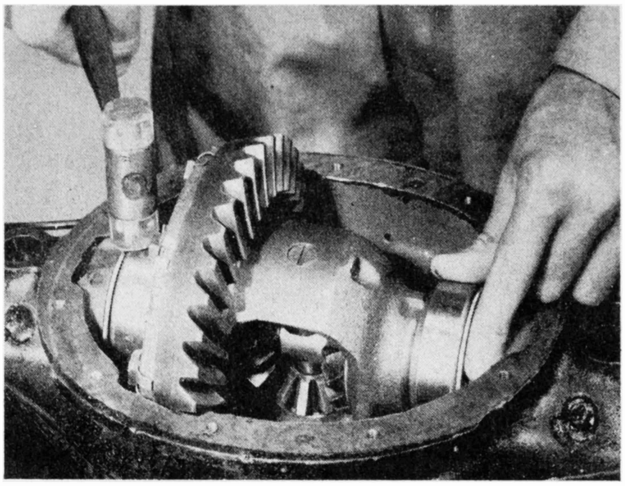


Figure 36—To place the 40 differential assembly in the housing tip the bearing cups out . . . then tap them into position with a plastic hammer.

INSPECTING TOOTH CONTACT— All Series

To be certain that you have adjusted the ring and pinion gears so that they mesh properly, it is necessary to inspect the tooth contact pattern.

Paint eight or ten teeth of the ring gear with a light coat of red lead in oil. Turn the ring gear around until the painted section of the ring gear is in contact with the pinion gear. Now turn the pinion with a wrench, while holding the ring gear with your other hand. This causes the two gears to turn under load and impresses a pattern on the painted section of the ring gear. This is the tooth contact pattern—the pattern that is the final proof of your adjustments.

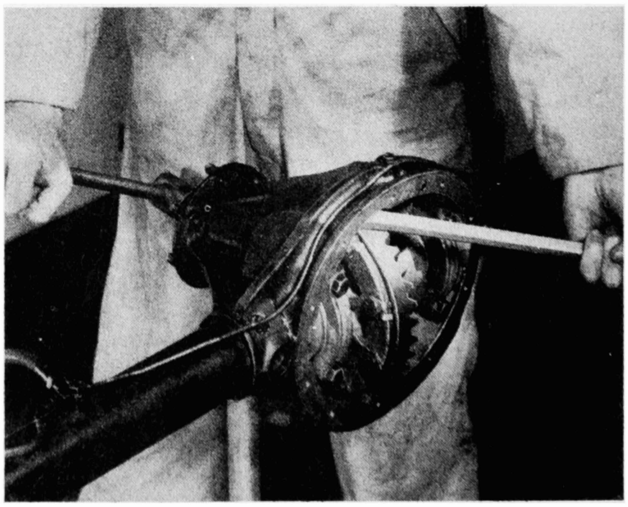


Figure 37—A tooth contact pattern is obtained by painting eight or ten teeth of the ring gear, meshing the painted section with the pinion gear, then turning the gears under load.

If all adjustments are correct, the tooth contact pattern will be evenly distributed over the entire tooth as in Fig. 38-A.

If the pattern is high on the ring gear, as in Fig. 38-B, it means the pinion is too far from the ring gear. In that case, move the pinion toward the ring gear by placing a thicker washer between the pinion gear and the bearing.

If the pattern is low on the ring gear tooth, as in Fig. 38-C, the pinion is too *close* to the ring gear. Then move the pinion *away* from the ring gear by placing a thinner washer between the pinion gear and the bearing.

If the pattern is toward the small end, or "toe," of the tooth, as in Fig. 38-D, the *ring gear* is too close to the *pinion*. In that case, move the ring gear away from the pinion, on the 40 Series by putting a thinner shim on the left side and a thicker shim on the right and, on the 60 Series, by taking shim away from the left side and tightening the adjusting nut on the right.

If the pattern is at the large end, or "heel," of the tooth, as in Fig. 38-D, the ring gear is too *far* from the pinion. Then move the ring gear *toward* the pinion, on the 40 Series, by putting a thinner shim on the right side and a thicker shim on the left side, on the 60 Series, by putting more shim into the left side and setting the adjusting nut accordingly.

When making toe or heel adjustments on the 40 Series, be sure you keep the same total thickness of shims at the side bearings.

REPLACING AXLE SHAFT BEARINGS—All Series

Press axle shaft bearings onto the axle shafts with the small diameter of the cone toward the outer, tapered end of the shaft. The pinion bearing replacing tool (J-1416) does the job.

Be sure to press the bearing on tight.

INSTALLING AXLE SHAFTS—All Series

The inner axle oil seal is extremely important in keeping lubricants around the bearings. Always use new seals when reassembling an axle. Soak the seals for at least 30 minutes in light lubricating oil to make them soft and pliable and prevent their being burned out in operation. Then install the seal, using the shaft oil seal replacer (J-2626 on the 40 Series and J-1556 on the 60 Series).

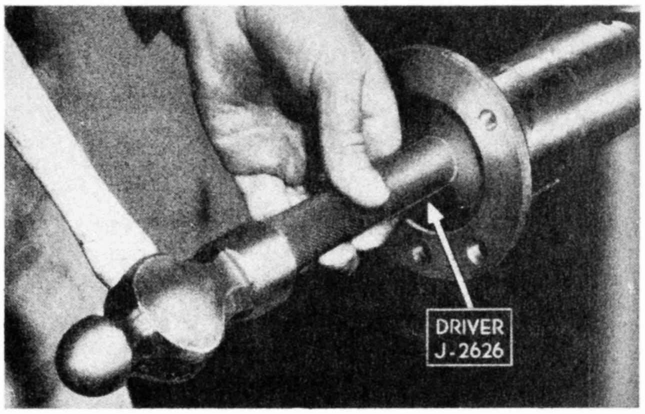


Figure 39—New oil seals should always be installed when axles are reassembled.

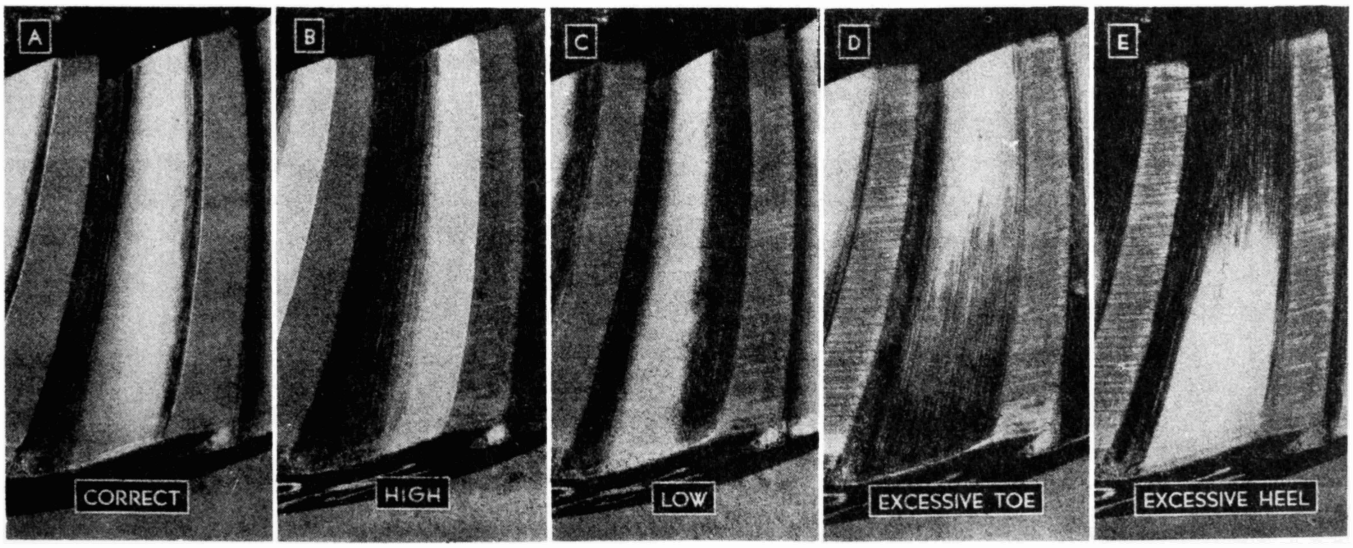


Figure 38—Tooth contact patterns. If all adjustments are correct and gear teeth are meshing properly, the pattern will be evenly spread over the face of the tooth as in A.

Next, install the axle shaft and bearing. Put it into the housing and index the splined end with the differential side gear. Lubricate the bearing properly.

Finally, install the outer axle bearing cup, driving it solidly into position with the axle shaft bearing cup replacer (J-1433-1) as shown in Fig. 40.

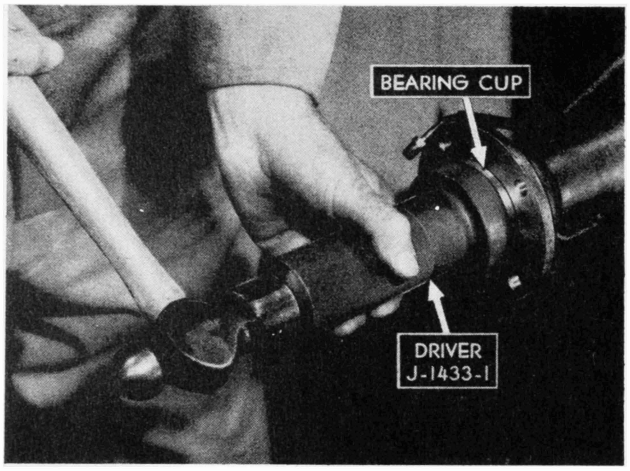


Figure 40—The outer axle shaft bearing cup is driven in solidly with Tool J-1433-1.

INSTALLING THE BRAKE BACKING PLATES—All Series

Before placing the brake backing plate onto the end of the axle, place a new outer oil seal in the plate. This is important, because this seal must be in good condition to keep axle lubricants from getting into the brakes.

On the 4740 and 4760 Series there is no provision for lubricating the wheel bearings after assembly. Therefore, with these models, pack the bearings with wheel bearing lubricant before assembling the brake backing plate.

Slide the original shims onto the axle. Then install the backing plate, spacer and cover. Tighten the cap screws that hold the backing plate to the axle housing flange. Then strike the end of each axle shaft with a lead hammer to drive the bearing cup on the opposite side solidly into position.

If the thickness of the original shims is not known, start with .030" of shims on each side. This will protect the thrust block from being damaged on assembly, until the correct axle adjustment is made. Line up the drain hole in the shims with the hole in the case.

ADJUSTING AXLE SHAFT END PLAY—All Series

With the axle shafts and brake backing plates installed and tightened, attach the axle shaft end play checking tool (J-2092) to the end of one shaft, and affix a dial indicator to the backing plate or on the flat side of the checking tool, as shown in Fig. 41. Then grasp the tool in both hands, pull it in and out, and read the end play on the dial. It should be between .004" and .006".

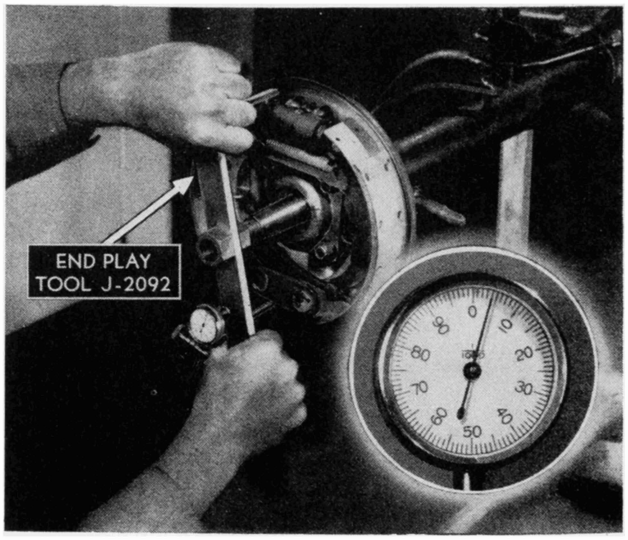


Figure 41—Axle shaft end play should be between .004" and .006".

If end play is outside these limits, it will be necessary to add or remove shims inside the backing plate. But first look at the axle shaft thrust block in the differential and see if it is approximately centered—so that there is at least 1/16" clearance on either side of the spider shaft. Then, to increase end play, add shims and, to decrease end play, remove shims. Finally, check again to be sure your shims are so divided between the two axle ends that the thrust block is centered.

INSTALLING THE WHEEL HUB—All Series

Before installing the wheel hub, check the key to be sure it fits snugly in the keyways, both in the axle shaft and in the hub.

Make sure that the tapers of the hub and axle are clean and dry.

Line up the keyways in the shaft and the hub, insert the key, and drive the hub onto the shaft . . . being sure that the outer end of the key is flush with the hub.

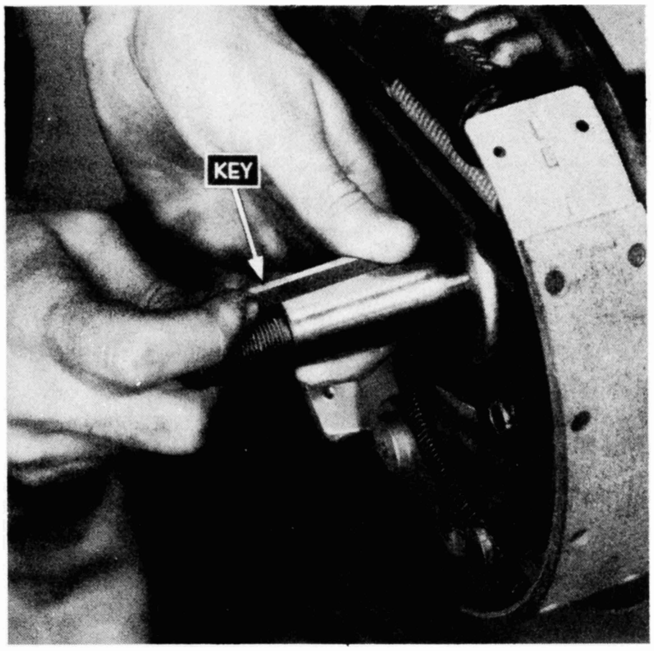


Figure 42—The key should fit smoothly and tightly into the axle shaft keyway.

Finally, put on the thrust washer and axle nut, and tighten the nut. Of course, after the axle has been installed on the car, you'll want to tighten the axle nuts again so you can be sure they're good and tight.

COMPLETING THE ASSEMBLY

After the axle has been installed on the car, fill the axle with hypoid lubricant. For complete and correct lubrication of Nash rear axles, refer to your lubrication chart.

While the car is on the lube hoist, make sure the vent in the housing is clear, because if plugged, pressure may form in the housing and cause oil seal failure.

FINAL INSPECTION—All Series

When the job has been completed—the axle has been disassembled, inspected, corrected, reassembled, and lubricated—give it another thorough road test and inspection as detailed in the first part of this manual section.

Give it the four tests to be sure it operates smoothly and quietly under all conditions.

Then, if it checks out okay, it's ready to be turned over to the customer.

SPECIFICATIONS FOR NASH REAR AXLES

Year	**4140**	**4240**	**4640**	**4740**
Type	Semi-Floating	Semi-Floating	Semi-Floating	Semi-Floating
Drive Gear Type	Hypoid	Hypoid	Hypoid	Hypoid
Ring Gear and Pinion Back-lash	.004″-.006″	.004″-.006″	.004″-.006″	.004″-.006″
Axle Shaft End Play	.003″-.006″	.002″-.004″	.002″-.004″	.002″-.004″
Pinion Shaft Bearing Tension	12″ lbs.-14″ lbs.	12″ lbs.-14″ lbs.	12″ lbs.-14″ lbs.	12″ lbs.-14″ lbs.
Pinion Bearing Adjustment	Shims	Shims	Shims	Shims
Differential Side Bearing Tension	.005″	.005″	.005″	.005″
Differential Side Bearing Adjustment	Shims	Shims	Shims	Shims
Axle Shaft End Play Adjustment	Shims	Shims	Shims	Shims
Lubrication Capacity	3 pts.	3 pts.	3 pts.	3 pts.
Type of Lubrication	SAE 90 Hypoid	SAE 90 Hypoid	SAE 90 Hypoid	SAE 90 Hypoid
Rear Axle Ratio (Standard)	4.1-1 Std.	4.1-1 Std.	4.1-1 Std.	4.1-1 Std.
Rear Axle Ratio (With Overdrive)	4.1-1 Std.	4.1-1 Std.	4.1-1 Std.	4.1-1 Std.

Year	**4160-80**	**4260-80**	**4660**	**4760**
Type	Semi-Floating	Semi-Floating	Semi-Floating	Semi-Floating
Drive Gear Type	Hypoid	Hypoid	Hypoid	Hypoid
Ring Gear and Pinion Back-lash	.004″-.006″	.004″-.006″	.004″-.006″	.004″-.006″
Axle Shaft End Play	.003″-006″	.002″-.004″	.002″-.004″	.002″-.004″
Pinion Shaft Bearing Tension	15″ lbs.-18″ lbs.	15″ lbs.-18″ lbs.	15″ lbs.-18″ lbs.	15″ lbs.-18″ lbs.
Pinion Bearing Adjustment	Shims	Shims	Shims	Shims
Differential Side Bearing Tension	.004″-.006″	.004″-.006″	.004″-.006″	.004″-.006″
Differential Side Bearing Adjustment	Adj. Nut	Adj. Nut	Adj. Nut	Adj. Nut
Axle Shaft End Play Adjustment	Shims	Shims	Shims	Shims
Lubrication Capacity	4 pts.	4 pts.	4 pts.	4 pts.
Type of Lubrication	SAE 90 Hypoid	SAE 90 Hypoid	SAE 90 Hypoid	SAE 90 Hypoid
Rear Axle Ratio (Standard)	4.1-1 Std.	4.1-1 Std.	4.1-1 Std.	4.1-1 Std.
Rear Axle Ratio (With Overdrive)	4.1-1 Std.	4.1-1 Std.	4.1-1 Std.	4.1-1 Std.

TRANSMISSION SECTION

Nash

TECHNICAL MANUAL

REMOVING NASH TRANSMISSIONS FROM THE CHASSIS 3

THE AMBASSADOR SERIES WITH OVERDRIVE

DISASSEMBLING THE TRANSMISSION 4

ASSEMBLING THE TRANSMISSION 9

THE AMBASSADOR SERIES WITHOUT OVERDRIVE

DISASSEMBLING THE TRANSMISSION 14

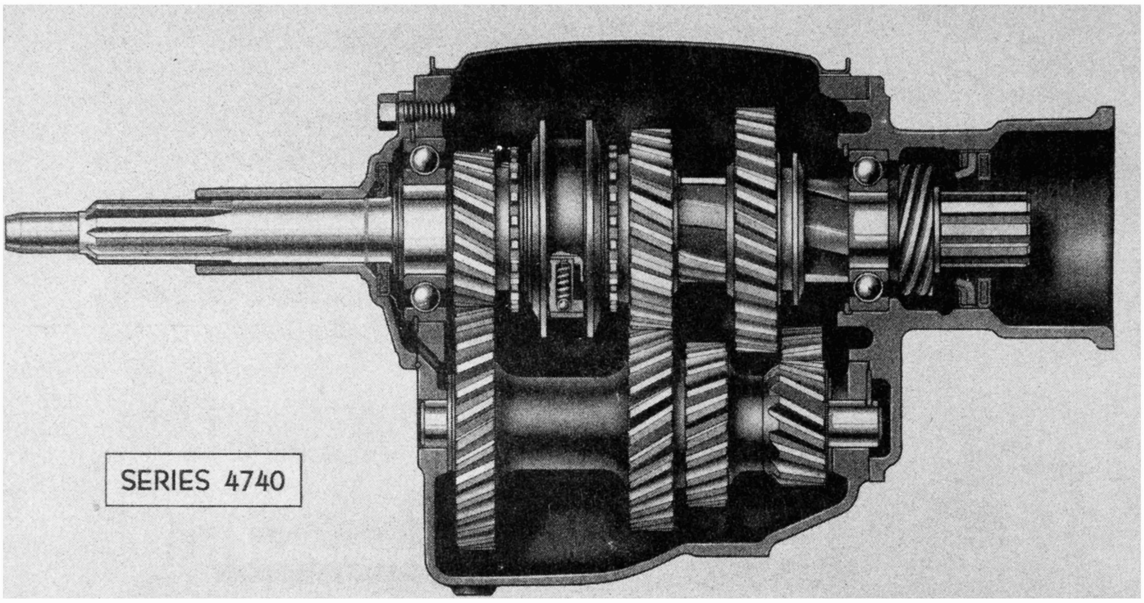
ASSEMBLING THE TRANSMISSION 15

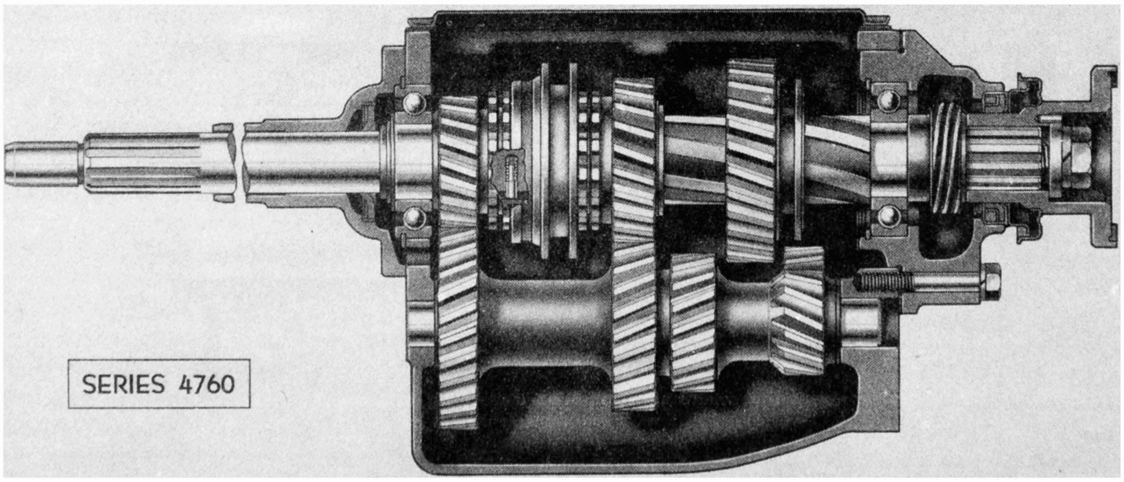
THE "600" SERIES

DISASSEMBLING THE TRANSMISSION 16

ASSEMBLING THE TRANSMISSION 19

NASH TRANSMISSIONS


SERIES 4740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TRANSMISSION SECTION
NASH TECHNICAL MANUAL

The conventional transmission used on Nash Automobiles is of the silent-shifting type, with three speeds forward and one reverse. Its helical cut gears insure quiet operation throughout a long life. Through the use of a synchronous clutch assembly, silent shifting is provided in second and high gears, as these gears are in constant mesh with the countershaft gears. An interlock assembly makes it impossible to engage more than one pair of gears at any one time.

All series have an inspection hole in the front floor board which supplies easy access to the transmission for inspection. Minor adjustments and replacement of the shifting shafts and forks can be made through this hole on all except the 46-4740 Series.

On the 46-4740 the transmission must be removed before the shifting shafts and forks can be taken out.

The procedure given in this manual is for a *complete* disassembly of the unit. Most of the time, of course, it won't be necessary to take everything apart. But your inspection of parts and assemblies will determine just how far you need to go in disassembling any transmission.

REMOVING NASH TRANSMISSIONS FROM THE CHASSIS

41-42-46-4740 Series

These series are equipped with torque tube drive, and before the transmission can be removed, the torque tube and rear axle assembly must be dropped. (See section on universal joints and propellor shafts.)

41-4260-80 and 46-4760 Series

These series are equipped with the conventional Hotchkiss drive which means that the propellor shaft must be disconnected at the front universal joint when the transmission is removed. (See Universal Joint Section.)

All Series

In general, when removing the transmission from any car, care must be taken not to damage the transmission clutch shaft (Fig. 1). Always use two guide-bolts (J-1434) in place of the two upper cap screws so the transmission shaft will slide out far enough to clear the clutch pilot bearing and clutch disc.

Before disassembling the unit remove the drain plug and let the lubricant drain out.

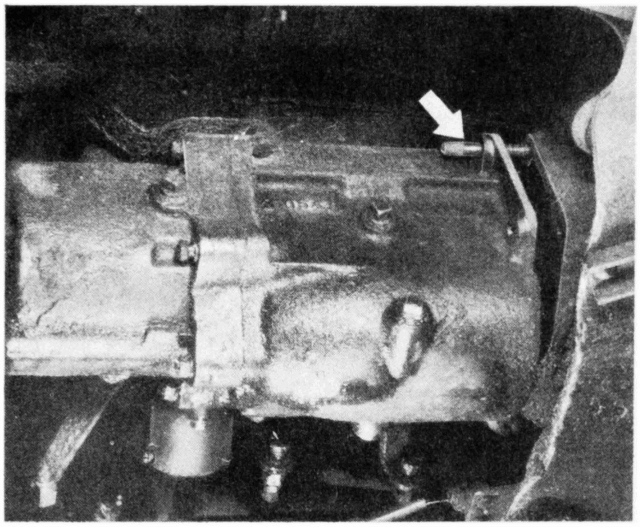


Figure 1—Guide bolts keep the transmission from dropping down and damaging the clutch pilot bearing.

THE AMBASSADOR SERIES WITH OVERDRIVE

(41-4260-80 and 46-4760 Series)

◆

DISASSEMBLING THE TRANSMISSION

The transmissions used on these series come with or without the overdrive assembly . . . the only difference being that a longer spline shaft is used with the overdrive. In order to cover the subject completely, the following information will apply specifically to the transmission equipped with overdrive.

It is not necessary to disassemble both the transmission and the overdrive to work on either one. Either unit may be disassembled independently of the other. The only time when *both* units must be disassembled is when the transmission spline shaft (which, in the overdrive, becomes the drive shaft) needs replacement.

Similarly, if the shifter mechanism needs repair, it can be removed from the case without removing the gears. Or, on a complete overhaul, the shifter mechanism can be left in the case until the gears have been removed.

REMOVING THE CASE COVER AND BAFFLE

Take out the cap screws and lift off the case cover, noting the position of the cover and baffle. The vent louver on the baffle should be at the rear of the case. The vent hole in the cover should be at the right. Otherwise there will be an excessive loss of lubricant. Now remove the baffle.

The Oil Trough

Remove the small cap screw on the top of the transmission case and remove the oil trough.

REMOVING THE SHIFT MECHANISM ONLY

Before removing the shift levers from the shift shafts, mark them so they can be reinstalled in the same positions. Use a long 1/8" punch. Drive the shifter shaft lock pins up from the bottom of the bosses (Fig. 2).

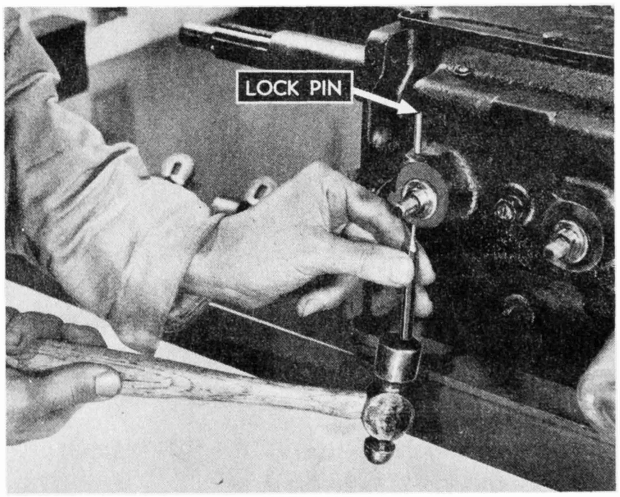


Figure 2—To disassemble the shifter mechanism it is necessary to drive out the shifter shaft lock pins.

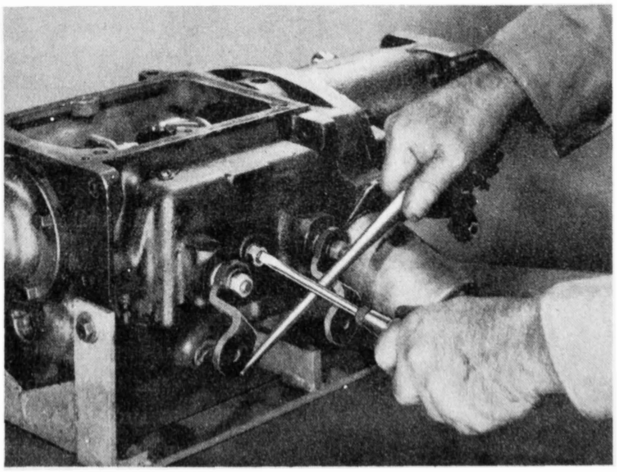


Figure 3—Move the shift levers to depress the speed finder plungers. Then tighten the lock screw.

With the gears in the neutral position, take hold of the two shifter levers and move them slightly away from each other so that the speed finder plunger will rise just out of the notches in each quadrant. Hold the levers in this position and tighten the speed finder lock screw on the outside of the case (Fig. 3). This will hold the plunger away from the quadrants so that they can be removed.

Remove the shift levers from the shift shafts. Using a soft drift, drive the shifting shafts toward the outside of the case. This will drive out the oil seals, retainers and shifter shaft sleeves from the case.

With the gears still in a neutral position, remove the low and reverse shifter fork. Then remove the interlock. Now remove the second and high gear shifter fork by working the pivot end toward the rear as the fork slips from the collar (Fig. 4).

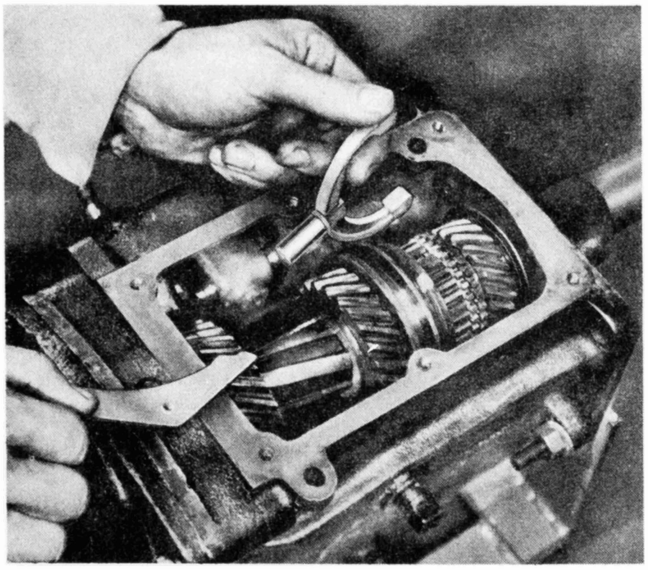


Figure 4—To remove the high gear shifter fork, draw the pivot end toward the rear, and lift it out.

To remove the shifter shafts from the case, shift the low sliding gear to the rear of the case along with the second and high speed shifter collar. This will allow the low gear shifting shaft to be removed easily.

The second and high gear shifter shaft should be turned so that the pivot hole in the quadrant points down. This will permit the quadrant to pass under the synchro-clutch until the threaded end of the shaft is free from the hole in the case. Grasp the threaded end of the shaft and lift it out through the top of the case.

REMOVING THE SPLINE SHAFT ASSEMBLY

Drop the Countershaft Gear

In order to remove the spline shaft and gears it is first necessary to drop the countershaft gear into the bottom of the case. To do this remove the pipe plug at the rear of the overdrive case. Then insert the small end of the countershaft aligning tool (J-1415-A) in the opening in the overdrive case and tap the countershaft out through the front of the transmission (Fig. 5).

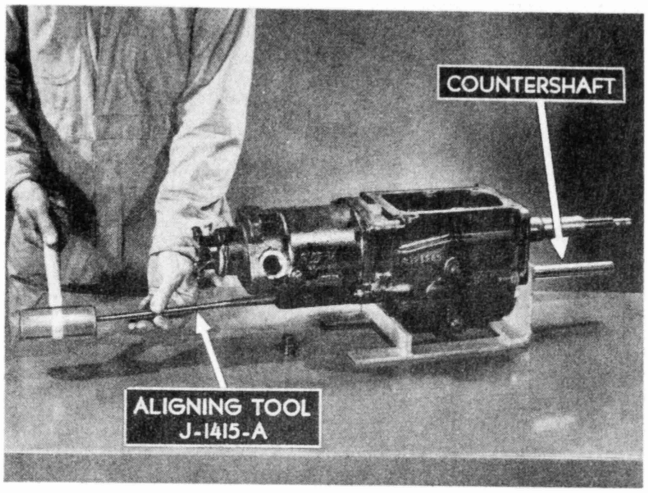


Figure 5—Before the spline shaft and gears can be removed the countershaft must be removed and the countershaft gear dropped. Use Tool J-1415-A.

CAUTION: *While removing the countershaft, keep the tool tight against the shaft so that the thrust washers won't drop to the bottom of the case.*

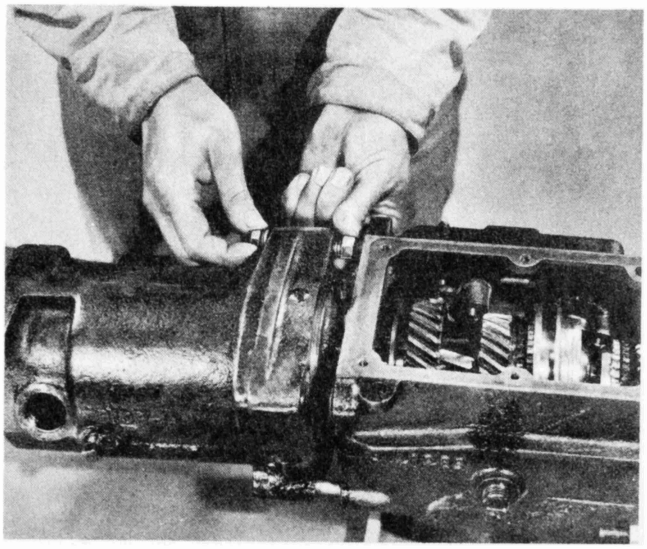


Figure 6—To keep overdrive parts from getting out of place, bolt the bearing adapter to the case after the unit is separated from the transmission.

Remove the Overdrive

Take out the bolts that hold the overdrive and bearing adapter to the transmission case and separate the overdrive front bearing adapter from the transmission.

> CAUTION: *As the overdrive case is being removed, hold the bearing adapter tight against the overdrive case. Then bolt the adapter to the case to keep overdrive parts in place. (Fig. 6).*

Now the spline shaft and gears can be pulled out through the rear of the transmission case.

As the spline shaft is removed, the front synchro-clutch friction ring will come off the shaft. Just lift it out through the top of the case.

REMOVING THE GEARS FROM THE SPLINE SHAFT

The gears are held on the spline shaft by the synchro-clutch retainer lock and pin. To remove this locking unit, depress the lock pin with a short, pointed tool (Fig. 7) and rotate the retainer lock until it clears the spline. Then slide the retainer off the shaft and take out the lock pin and spring.

> CAUTION: *As you remove the retainer be careful that the spring-loaded lock pin does not fly out.*

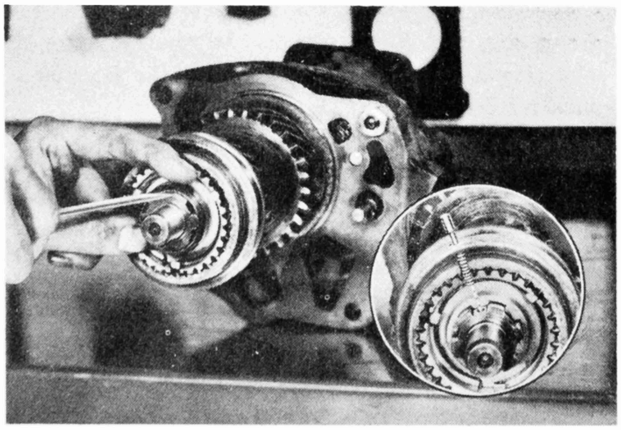


Figure 7—The synchro-clutch lock and pin hold the gears on the spline shaft. To remove them, first depress the lock pin. Then rotate the retainer and slide it off the shaft.

The Synchro-Clutch Assembly

Remove this unit from the shaft. It is serviced as a complete assembly, so further disassembly is not necessary. The rear friction ring, however, can be removed. It should be marked so that it can be replaced in the same position during reassembly.

The Second Speed Gear

Slide the bronze thrust washer and the second speed gear off the shaft. Then take off the rear thrust washer (Fig. 8).

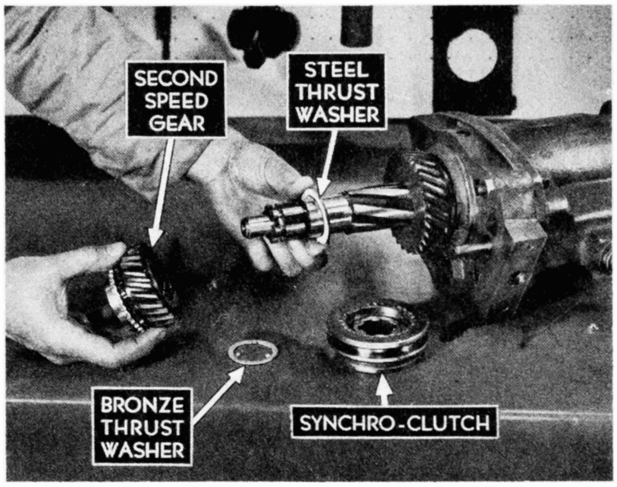


Figure 8—With the synchro-clutch off, take off the bronze thrust washer, the second speed gear and the rear thrust washer.

The Low and Reverse Sliding Gear

Just slide the low and reverse sliding gear off the front of the spline shaft as shown in Fig. 9.

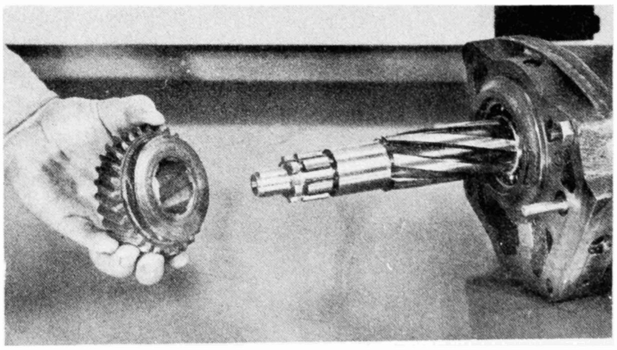


Figure 9—Last off the spline shaft is the low and reverse sliding gear. Just slide it off the shaft.

REMOVING THE CLUTCH SHAFT ASSEMBLY

The Bearing Cap

Take out the cap screws that hold the front bearing cap to the transmission case—then remove the cap—and drive out the front bearing cap oil seal.

> *Notice the oil drain hole in the bearing cap. It should be at the bottom and lined up with the return hole in the case. Otherwise transmission lubricant will leak into the clutch housing.*

The Clutch Shaft

Remove the clutch shaft and front bearing from the front of the case as shown in Fig. 10. If the bearing is stuck in the case, use a fiber hammer to dislodge it.

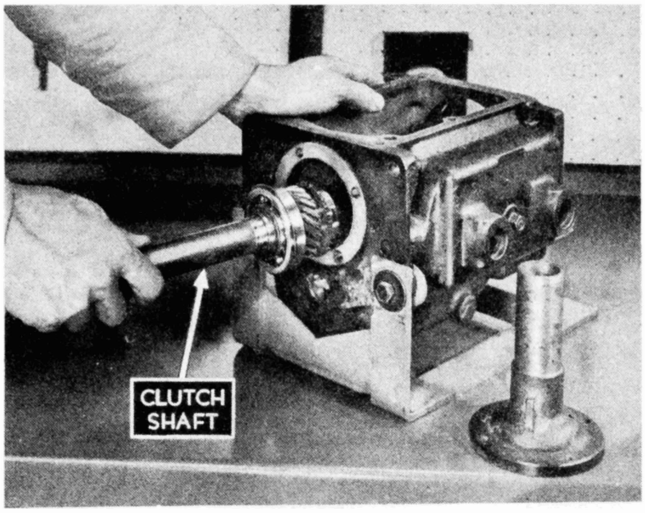


Figure 10—The clutch shaft and front bearing are removed from the front of the transmission case.

The Front Bearing

To remove the front bearing from the clutch shaft it is necessary to remove the snap ring. Then press the bearing off the shaft in an arbor press, using bearing plate J-1298-N (Fig. 11).

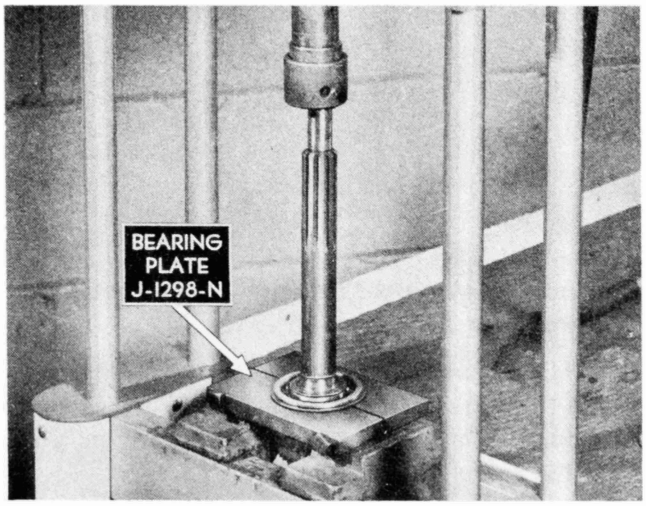


Figure 11—Bearing plate J-1298-N is used to press the front bearing off the clutch shaft.

The Bearing Lock Ring

This ring, which fits around the front bearing, may or may not be removed from the bearing. However, it should be checked to be sure it's the right thickness.

The Roller Bearing

Inside the rear end of the clutch shaft is a roller bearing consisting of fourteen "loose" rollers. This is the front bearing for the spline shaft. The rollers are held in place by a "keystone" effect, just the way a stone arch supports itself. A snap ring keeps them from sliding out at the end.

Worn or loose rollers in this bearing will result in a noisy transmission. Inspect for pitted or scored rollers. Jar the end of the clutch shaft against a block of wood (Fig. 12). If the rollers fall out, they are too loose and should be replaced.

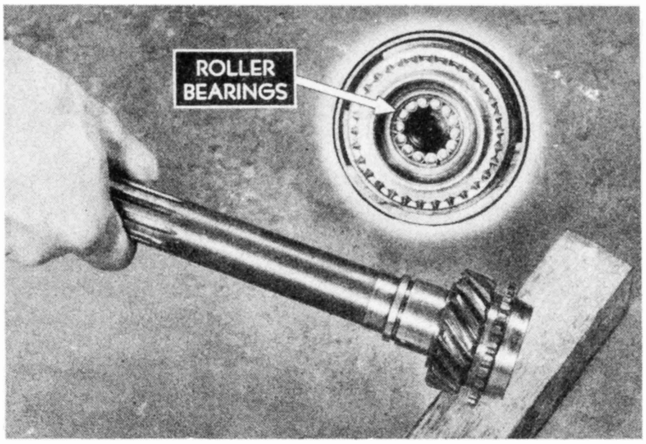


Figure 12—Bearing rollers inside the clutch shaft hold themselves in place by a "keystone" effect. Jarring the shaft will show if these rollers are loose.

REMOVING THE COUNTERSHAFT GEAR

Take out the countershaft tool (J-1415-A) and lift the countershaft gear out through the top of the case. Then remove the two thrust washers that are between either end of the gear and the case (Fig. 13). Inspect these washers. If they are scored or worn, replace them.

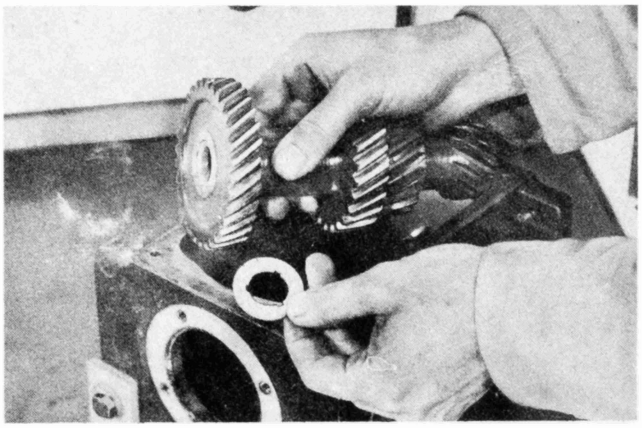


Figure 13—With the spline shaft and gears out of the way, the countershaft gear and thrust washers can be lifted out through the top of the housing.

REMOVING THE REVERSE IDLER GEAR

Insert a long brass drift through the front of the transmission and drive the reverse idler shaft out toward the rear (Fig. 14). Then lift the reverse idler gear out of the case.

Take care not to damage the end of the shaft as you are driving it out.

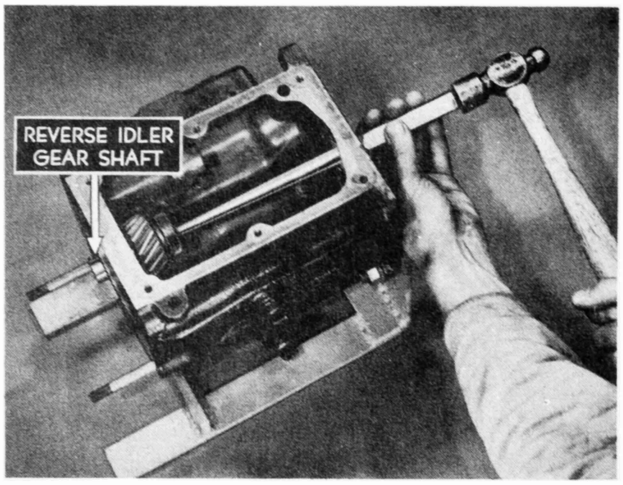


Figure 14—To remove the reverse idler gear and shaft, just drive the shaft out toward the rear with a brass drift.

CLEANING AND INSPECTING PARTS

With the transmission completely disassembled, all parts should be cleaned carefully so that a thorough inspection can be made.

Gears

Wash all gears in an approved cleaning solution. Then go over them carefully, checking for worn, cracked or chipped teeth. Slide each gear onto a *new* shaft to check for a good fit. If any gear appears to be loose on a new shaft or to have excessive tooth wear, it must be replaced.

Bear in mind that, whenever any transmission gear needs replacement, the gear with which it meshes should also be replaced. Any two mating gears should be replaced together.

Bearings

Bearings must be handled with great care because very few bearings removed during the course of service work will be free from dirt or foreign matter. In some cases there is enough dirt to affect the "feel" of the bearing.

After bearings have been removed *do not spin them,* either by hand or with compressed air. Just wrap them in clean cloth or paper and set them aside until they can be washed.

To wash a bearing, submerge it in a cleaning solution that is absolutely free of dust and rotate it to flush away old oil and dirt. Dry the bearing with care.

Then examine each bearing carefully to be sure it is free-rolling and has no cracked races or damaged balls or rollers.

Spline Shafts

Fit the splined gears onto the spline shaft to be sure they slide on and off easily. There should be neither excessive looseness nor binding. If the fit is tight, look for burred edges on the splines.

Synchro-Clutch and Friction Rings

Make a careful inspection of the synchro-clutch and friction rings. Slide the rings onto the cones of the second speed gear and the main drive gear. If you find excessive wear on the taper, replace the ring.

Inspect the ends of the teeth on the synchro-clutch collar for wear. Engage these teeth with the corresponding teeth on the second speed gear and the main drive gear. These teeth are chamfered for easy engaging and should not be burred.

Inspect the blockers for excessive wear and damage. Inspect the teeth in the shift collar for wear or a tapered condition which may have been caused by repeated gear disengagement. If a tapered condition is noted on the teeth of the synchro-clutch collar, replace the synchro-clutch assembly and the mating gear.

Replacing Synchro-Clutch Blockers and Retaining Ring

If new blockers must be installed in the synchro-clutch, first mark the collar with the hub so that they can be reassembled in the same position. Then slide the collar off the hub.

Install the three blockers in the hub with the open side of the blockers toward the center of the hub. Then slide the collar back onto the hub, lining up the marks that were made during disassembly.

Hold the hub in the palm of your hand so that the three blockers extend up under the collar far enough to install the ring. Insert the lip of the ring in the recess in one of the blockers. Then place the ring around and under each of the two remaining blockers. Then push the three blockers down so that the ring is flat against the hub. Turn the assembly over in your hand and place the other ring in the blockers in the same manner, but insert the lip of the ring in a different blocker from the one in which the ring on the opposite side is engaged.

Transmission Case

Finally, examine the bearing surfaces in the transmission case. Look particularly for wear or scoring . . . indicating that the bearing race has been revolving. Be sure the housing is clean.

ASSEMBLING THE TRANSMISSION

INSTALLING THE REVERSE IDLER GEAR

Install the reverse idler gear with the chamfered side of the teeth toward the front of the case (Fig. 15). Then drive the reverse idler shaft in from the rear of the case, with the notched end of the shaft toward the rear.

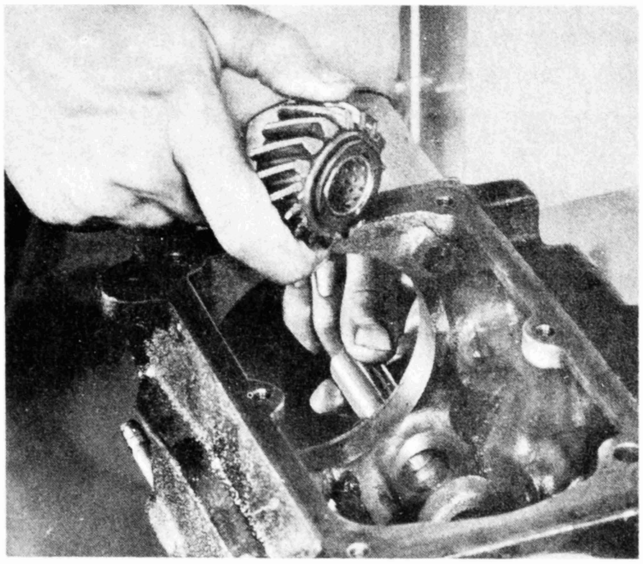


Figure 15—The reverse idler gear is installed first, with the chamfered side of the teeth toward the front.

INSTALLING THE COUNTERSHAFT GEAR

The countershaft gear is installed with the large gear at the front of the case. At each end of this gear is a thrust washer which must be placed so that the lip of the washer will line up with a notch in the case.

Lower the gear into the case and place the front washer in position. Insert the small end of the countershaft tool (J-1415-A) through the front of the case. Then, while holding the gear against the front washer, slip the rear washer in through the large opening in the rear of the case (Fig. 16).

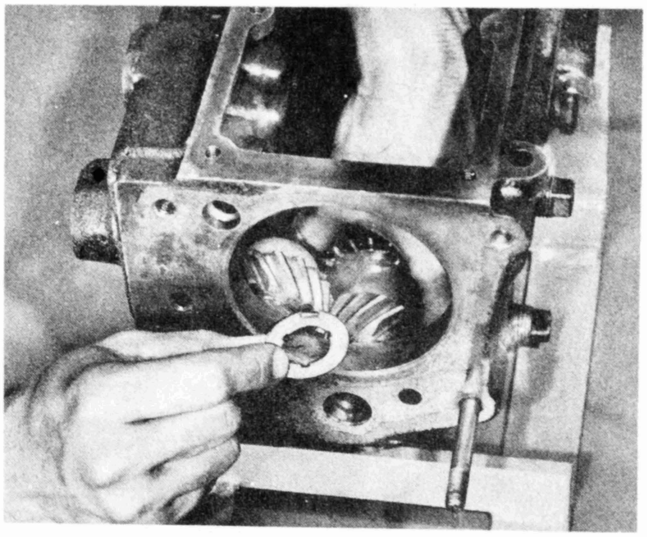


Figure 16—After the countershaft gear and front washer have been positioned, slip the rear washer in through the opening in the case.

Push the tool all the way through, and let the gear drop down on the tool without disturbing the washers at each end (Fig. 17).

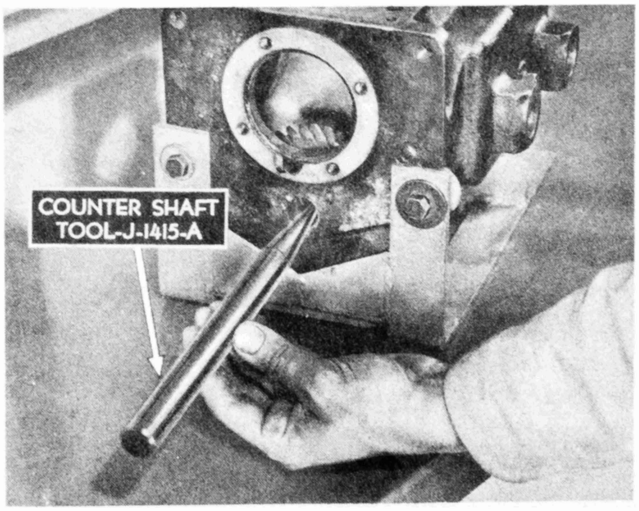


Figure 17—With the washers in place, push the tool through and let the countershaft gear drop down on it.

INSTALLING THE SHIFTER SHAFTS

The shifter shaft with the notches far apart on the quadrant is the low and reverse shaft and is installed toward the rear of the case.

When the Transmission Is In the Car

When the shifter shafts are being replaced in the car and the transmission has not been completely disassembled, the low and reverse shifter shaft can be installed by moving the low sliding gear to the rear of the case. This allows the shaft to enter the hole in the case freely.

To install the second and high shifter shaft, place the shift collar in the second speed gear position.

> CAUTION: *Work from the right side of the case. This is important.*

Lower the shaft through the top of the case with the fork pivot hole in the quadrant to the rear. Allow the shift shaft to drop down onto the ledge in the bottom of the case. With your right hand work the threaded end of the shaft toward the case hole. At the same time, rotate the quadrant so that the pivot hole will move down, allowing the quadrant to pass under the synchro-clutch until the shaft can enter the hole in the case. Then lift the shaft into position and rotate it so that the speed finder notches are at the rear.

> NOTE: *Starting with Serial Number R-444510 standard transmission and Serial Number R-443972 overdrive transmission, design changes were made in the shifter shafts, forks and sleeves of the 4760 Series. Therefore, if it is necessary to replace any of these parts on older Serial Numbers, the entire group of parts must be replaced with those of new design. The new design parts can be identified by the fact that the shifter shaft quadrant is a forging pressed onto a machined steel shaft.*

46-4760 Series Starting with Serial Number N6-120026 (with Governor-Controlled Overdrive) and . . .

4260-80 and 4660 Series Below Serial Number N6-120026 (either without Overdrive or with Centrifugal-Clutch Overdrive)

In replacement of shifter parts on these series, a group package should be used. The package consists of shifter shafts, shifter forks, interlock, shifter sleeves and lock pins.

> *No former or superseded parts or components of the new groups will be supplied for service.*
>
> *They must be replaced as a group.*
>
> *The new parts can be identified from the old by the following distinguishing features:*

- Larger diameter of shifter fork pivots.
- New forged cams pressed onto steel shafts, with larger fork pivot holes.
- Deeper notches in inter-lock to accommodate larger forks.
- Sleeves have two annular grooves and larger inside diameters to fit larger shafts.

INSTALLING THE CLUTCH SHAFT ASSEMBLY

Drive the transmission front bearing onto the clutch shaft and, using the transmission snap ring installing tool (J-1416), lock the bearing in position with the snap ring (Fig. 18).

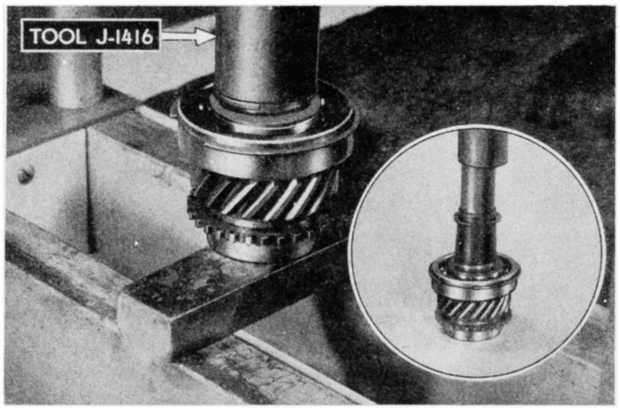


Figure 18—Tool J-1416 is used to install the transmission front bearing snap ring.

This snap ring is available in five sizes (thicknesses): .087", .090", .092", .093" and .096". Be sure the bearing is tight against the shoulder on the shaft. Then select the size snap ring that just fills the groove in the shaft.

Install the fourteen rollers and the snap ring in the end of the clutch shaft. Lubricate them with a light oil.

Then slip the clutch shaft and bearing into the opening in the front of the case.

4760 Series Starting with Serial Number R-432167 (Overdrive) and R-432468 (Standard)

A new clutch shaft is used in conjunction with the new bearing cap and front bearing lock ring. This shaft can be identified by the absence of the oil hole which in previous production was drilled from the front side of the bearing to the hole or recess just ahead of the main shaft pilot rollers.

The Front Bearing Lock Ring

This lock ring fits into the groove around the outside of the front bearing. Before installing it, however, be sure to check to see if you have the right thickness ring for that model.

Prior to Serial Number R-432167 overdrive transmission and Serial Number R-432468 standard transmission, the correct thickness for this lock ring is .065". This ring is used with a bearing cap that has a lock ring counterbore of 3-7/64" diameter and .078" depth.

In all production since the above serial numbers the lock ring should be .077" thick. It is used with a bearing cap with a counter-bore of 3-5 32" diameter and .064" to .067" depth. This new design pinches the lock ring between the counterbore of the bearing cap and the face of the transmission.

The Front Bearing Cap

Install a new front bearing cap oil seal. Then install the front bearing cap, being sure that the oil return hole is at the bottom so that oil seeping by the bearing will return to the transmission. Always use a new gasket between the bearing cap and the transmission.

Prior to Serial Numbers R-432167 and R-432468, the inner counterbore of the bearing cap contacted the forward side of the bearing, forcing the .065" snap ring tight against the case. This left clearance between the cap and the case. When working on these models, determine the clearance between the cap and the transmission case with a feeler gauge. Then use gaskets of sufficient thickness to take up this clearance. The gaskets are available in various thicknesses. *This is important!* —clutch shaft end play should not exceed .005". .000 is preferred.

Bolt the bearing cap to the transmission case.

ASSEMBLING THE GEARS ON THE SPLINE SHAFT

The Low and Reverse Sliding Gear

This gear goes on first. Slide it onto the shaft with the shifting collar toward the rear. The gear should be free to slide on the splines for easy shifting.

The Second Speed Gear

First, install the second speed gear *steel* thrust washer. Put it on the shaft with the chamfer toward the rear end. Line up the tongue with the notch on the spline shaft. Be careful that this washer does not slip out of this position as you install the second speed gear.

Next, install the second speed gear with the tapered cone toward the front.

Finally, install the *bronze* synchro-clutch thrust washer in such a position that the projections of the tongues on the washer are toward the front of the shaft. When the washer is seated, rotate it just enough to put the tongues behind the splines on the shaft (Fig. 19).

Be very careful to keep this washer in position as you install the synchro-clutch. If it turns at all, the clutch hub will bear on the projection of the washer rather than the ring. Thus the synchro-clutch will not become properly seated . . . preventing the retainer ring from being installed and locked.

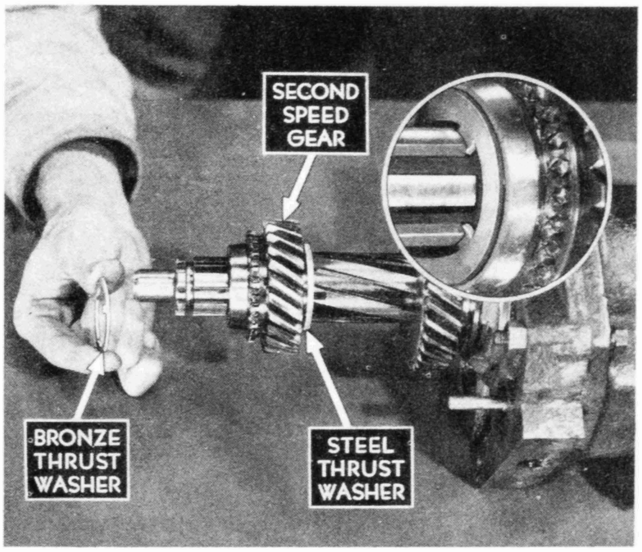


Figure 19—The bronze synchro-clutch washer should be installed with the projections of the tongues toward the front of the shaft and behind the splines. If it slips out of position the synchro-clutch retainer lock cannot be installed.

The Synchro-Clutch Assembly

Install the rear synchro-clutch friction ring (as marked during disassembly) and install it on the taper of the second speed gear. Then install the synchro-clutch assembly on the splines of the shaft and line up the three slots of the rear friction ring with the blockers in the synchro-clutch.

The Clutch Retainer and Lock Pin

All of the spline shaft gears and washers, as well as the synchro-clutch, are held on the shaft by this retainer. It also governs the end play of the second speed gear; thus it is important to install it properly.

These retainers come in three thicknesses: .083″, .085″ and .088″. Select the size that will give from .002″ to .004″ end play in the second speed gear (Fig. 20). When you have the right size, insert the lock pin and spring, depress the lock pin, install the retainer on the shaft, release the lock pin, and turn the retainer until the lock pin snaps into position.

If the smallest retainer cannot be installed, inspect the synchro-clutch thrust washers for proper alignment.

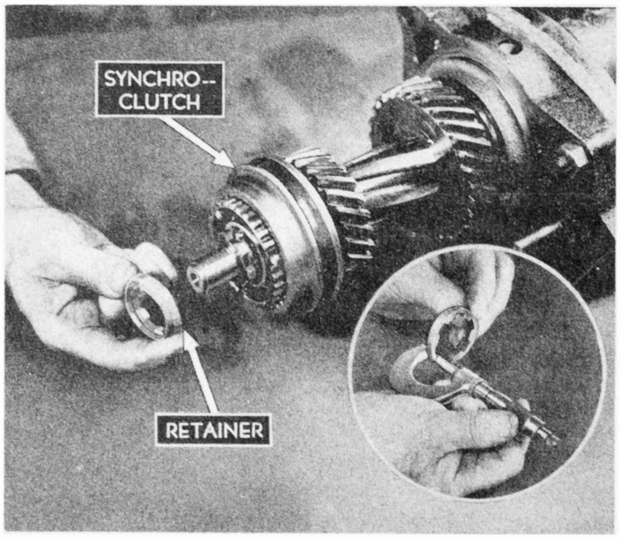


Figure 20—Fitting the synchro-clutch lock retainer. It should permit from .002″ to .004″ end play in the second speed gear.

Now, install the shifter shafts as detailed on page 10.

This completes the assembly of the spline shaft and gears, and the entire unit is ready to be installed in the transmission case.

INSTALLING THE SPLINE SHAFT ASSEMBLY

Place new gaskets between the bearing adapter and the transmission case—one on each side of the shims.

Install the spline shaft assembly in the case through the rear opening. As you do this, locate the front synchronizer friction ring on the clutch shaft cone (Fig. 21). Be sure the three slots in the ring line up with the blockers in the synchro-clutch.

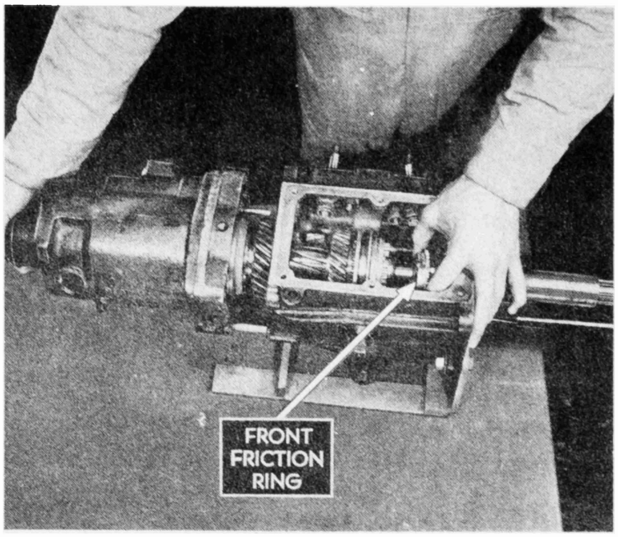


Figure 21—As the spline shaft and gears are put into the case, slip the front friction ring into position.

As you push the spline shaft into position, check to be sure that the reverse shifter rod in the overdrive lines up with the low and reverse shifter shaft quadrant in the transmission. Install the stud sleeve at the lower left transmission to overdrive case stud. This assures alignment of the overdrive case with the transmission and assures freedom of shifter rod movement. Then bolt the overdrive and bearing adapter assembly to the transmission case.

Friction Ring Clearance

As you assemble the transmission, give close attention to the spacing and clearances of the friction rings. Excessive friction ring clearance may cause second speed gear disengagement. For the synchro-clutch to give silent, efficient shifting, these clearances must be right.

The transmission shift collar centering gauges (J-1410) are used to measure these clearances. Place one gauge between the front face of the front friction ring and the rear face of the clutch gear as shown in Fig. 22.

Place the other gauge between the rear friction ring and the second speed gear. These gauges are .075″ thick and should slip into position freely. If they don't, make sure that the friction rings are free from the cones on the gears. Placing these gauges in position centers the shift collar.

Working with the front gauge, it should be from a tight fit to .015″ clearance. If the adjustment is not correct, add shims between the transmission case and the rear bearing adapter to increase clearance. Remove shims to decrease clearance.

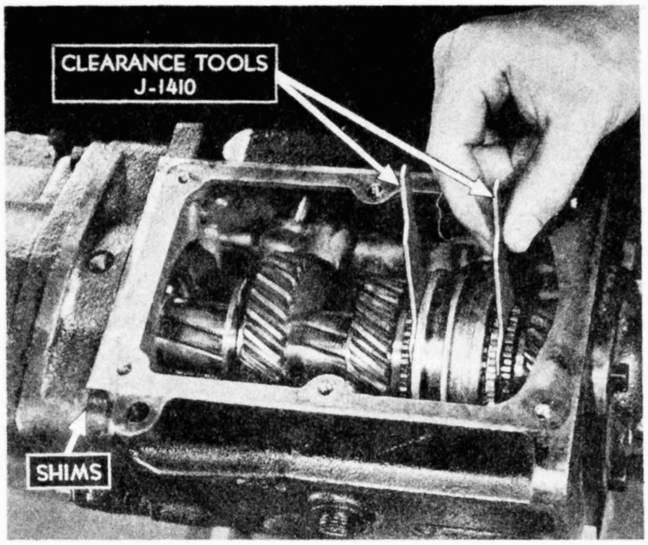


Figure 22—Special gauges, .075" thick, are used to measure friction ring clearance.

INSTALLING THE COUNTERSHAFT

To raise the countershaft into mesh with the main drive gear and the second speed gear, tip the transmission upside down. The gear will drop into place (Fig. 23).

> *While doing this, check to be sure the countershaft thrust washers are lined up with the notches in the case. (See page 9, Fig. 16.)*

Then tap the countershaft in from the front of the case, holding pressure against the countershaft tool as it is forced out of the case by the countershaft. When the countershaft is in position, replace the drain plug in the rear of the case.

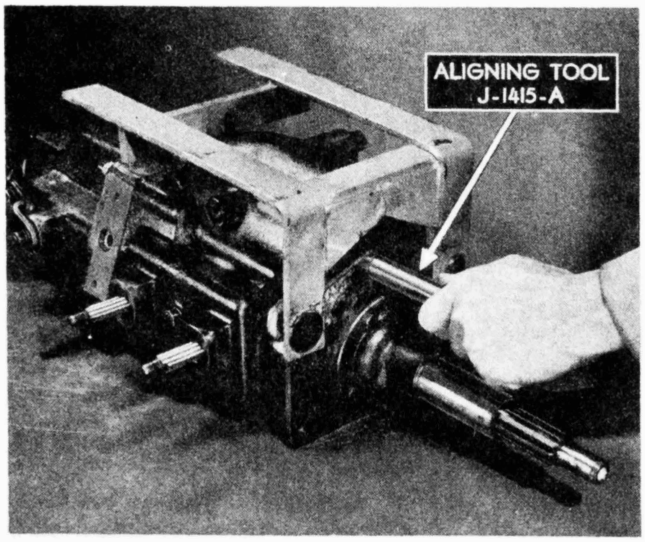


Figure 23—Tipping the case upside down will allow the countershaft gear to mesh with the main drive gear and second speed gear. Then the countershaft can be tapped into place.

INSTALLING THE SHIFTER FORKS AND SLEEVES

Take the second and high speed shifter fork (the larger fork) with the machined flat on the fork, just below the pivot pin, down. Enter the shoe end of the fork into the synchro-clutch shift collar (with the gear in neutral position). Insert the pivot end of the fork in the pivot hole in the quadrant (Fig. 24).

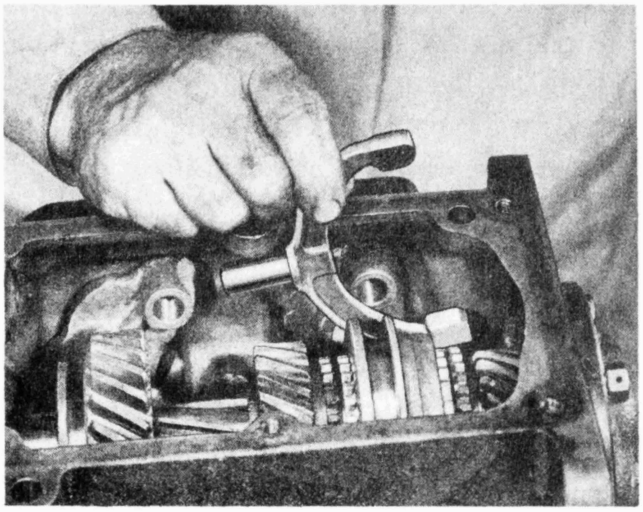


Figure 24—With the spline shaft in place, install the second and high speed shifter fork by working the pivot into the shifter shaft.

Then install the interlock plate. Hold it in a vertical position, slightly to the rear. Then place it in a horizontal position so that the recess will contact the bottom side of the second and high shifter fork pivot pin.

In similar fashion, install the low and reverse shifter fork in the rear shaft, making sure that the longer prong is at the top. (The low gear should be in neutral position.)

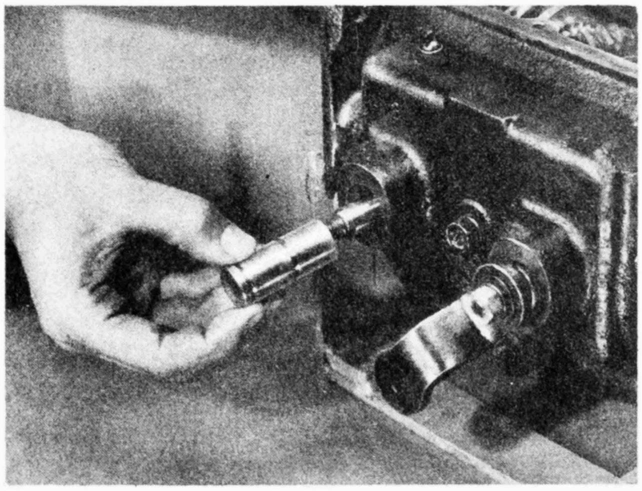


Figure 25—Shifter shaft sleeves should be inserted with the grooved ends outward.

Shifter Shaft Sleeves

Install the shifter shaft sleeves from the outside of the case and tap them into position. The notches on the sleeves should be toward the outside of the case (Fig. 25).

Install the shifter shaft sleeve lock pins, lining up the grooves in the sleeves with the lock pin holes in the case. Drive the pins in from the top. Then, using new cork seals, install the seals and retainers over the ends of the shifter shafts (using Tool J-2633).

Next, install the shifter levers on the shafts so that they point down and toward the front.

Finally, release the set screw just enough to allow the speed finder plungers to operate freely—then tighten the set screw lock nut.

The Oil Trough

Install the oil trough with the open end inserted in the rear of the case. Then install the washer and screw to secure the oil trough to the transmission.

COMPLETING THE ASSEMBLY

The transmission is now completely assembled and needs only a final check before the cover can be put on and the unit returned to service. To check the assembly, just operate it in all gears, checking the shifting mechanism carefully. Then put on the baffle and cover.

In order to avoid leakage, it is important to put the baffle and cover on correctly. First, fit a gasket over the case and lay the baffle on it with the air vent to the rear. Then lay another gasket on top of the baffle and put the cover on top with the air vent to the right side. Bolt the cover down and the job is completed.

THE AMBASSADOR SERIES WITHOUT OVERDRIVE

(41-4260-80 and 46-4760 Series)

◆

DISSASSEMBLING THE TRANSMISSION

In most points the procedure for disassembling and assembling the transmission without overdrive is the same as that for the transmission with overdrive. In those cases, this section of the manual will refer you to the previous section for the proper techniques. Only where the procedure is definitely different will it be covered in detail.

REMOVING THE SHIFT MECHANISM ONLY

(Just as detailed on page 4.)

REMOVING THE SPLINE SHAFT ASSEMBLY

Remove the Companion Flange

First, remove the large cap screw and washer that holds the companion flange to the spline shaft. Then, using Puller J-1412 as in Fig. 26, pull the companion flange.

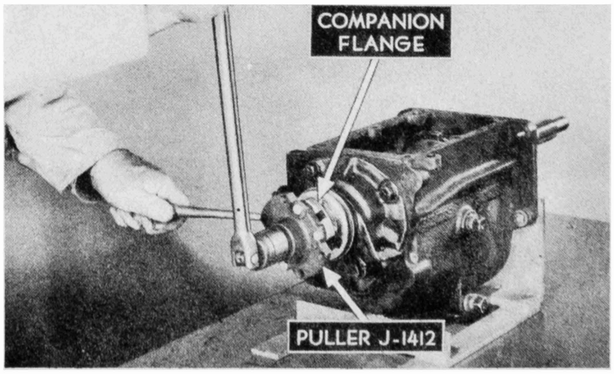


Figure 26—A special puller is used to remove the companion flange from the spline shaft.

Drop the Countershaft Gear

Remove the four cap screws that hold the rear bearing cap to the transmission case. Then rotate the bearing cap clockwise until the countershaft hole is clear. Using the countershaft aligning tool (J-1415-A) tap the countershaft out through the front of the case (Fig. 27). Push the tool through the transmission far enough to permit the countershaft gear to drop down on the small end of the tool.

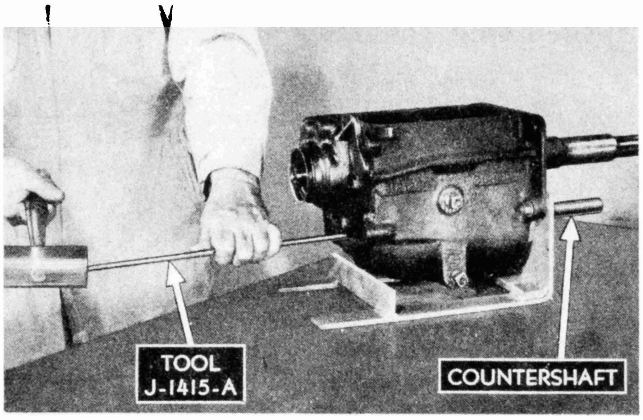


Figure 27—On the Standard transmission, the countershaft is tapped out through the front of the case.

Remove the Spline Shaft and Gear Assembly

With the countershaft gear in the bottom of the case, the spline shaft and gears can be drawn out through the rear of the case. As the main shaft is separated from the clutch shaft, lift the front friction ring out through the top of the case; otherwise it will slip off and drop to the bottom.

REMOVING THE GEARS FROM THE SPLINE SHAFT

Remove the synchro-clutch, the second speed gear, and the low and reverse sliding gear from the spline shaft as detailed on page 6 of this manual.

The Rear Bearing and Bearing Cap

Using a screw driver remove the snap ring that holds the bearing and shaft into the bearing cap. The bearing and shaft can then be removed from the cap. Now the speedometer drive gear can be removed. Finally, drive out the rear bearing oil seal with a wood block. Discard this seal, as a new one will be used in reassembly.

Press the bearing from the shaft.

REMOVING THE CLUTCH SHAFT ASSEMBLY

(See page 6.)

REMOVING THE COUNTERSHAFT GEAR

(See page 7.)

REMOVING THE REVERSE IDLER GEAR

(See page 8.)

CLEANING AND INSPECTING PARTS

(See page 8.)

That completes the disassembly of the 60 Series transmission without overdrive, and you're ready to go to work and put it back together.

ASSEMBLING THE TRANSMISSION

INSTALLING THE REVERSE IDLER GEAR

(See page 9.)

INSTALLING THE COUNTERSHAFT GEAR

(See page 9.)

INSTALLING THE SHIFTER SHAFTS

(See page 10.)

INSTALLING THE CLUTCH SHAFT ASSEMBLY

(See page 10.)

ASSEMBLING THE GEARS ON THE SPLINE SHAFT

The Rear Bearing and Bearing Cap

Install the rear bearing on the spline shaft with the closed side of the bearing toward the front. Then install the bearing and shaft in the cap and lock them in place with the snap ring (Fig. 28).

Be sure the snap ring is securely seated in the ring groove.

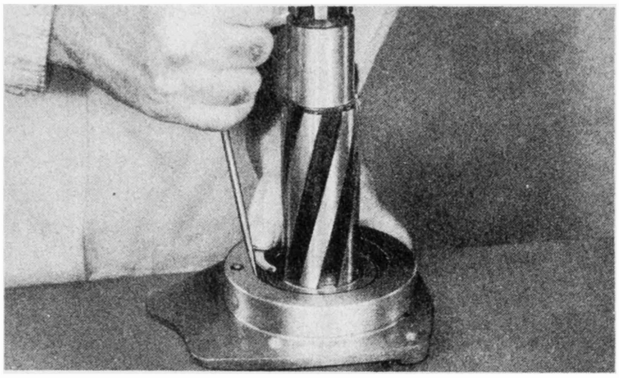


Figure 28—Lock the rear bearing and shaft in the cap with a snap ring.

Finally, complete the assembly of the spline shaft by installing the low and reverse sliding gear, the second speed gear, the synchro-clutch assembly, and the clutch retainer and lock pin as detailed on page 11.

INSTALLING THE SPLINE SHAFT ASSEMBLY

Place the same number of shims between the bearing cap and the transmission case as you removed during disassembly. Use a new gasket on each side of these shims.

Then install the shaft through the rear of the case. Install the front friction ring on the cone of the clutch shaft (as shown in Fig. 21, page 12). As you do this, be sure that the slots in the friction ring line up with the blockers in the clutch assembly.

Then bolt the rear bearing cap to the transmission, testing to be sure that all gears are free to turn.

Friction Ring Clearance

With the spline shaft assembled in the transmission, inspect friction ring clearance as detailed on page 12 (Fig. 22).

INSTALLING THE COUNTERSHAFT

(See page 13.)

INSTALLING THE SHIFTER FORKS AND SLEEVES

(See page 13.)

COMPLETING THE ASSEMBLY

With the unit completely assembled, test its operation, then put on the baffle plate and cover (as detailed on page 14).

THE "600" SERIES

(46-4740 Series)

◆

DISASSEMBLING THE TRANSMISSION

The transmissions in the 46-4740 Series are fundamentally the same as in the Sixty Series. However, due to small differences in design, the procedure for disassembling and assembling them is somewhat different.

REMOVING THE CASE COVER

The cover on this transmission has the vent hole at the front. Inspect this hole as you remove the cover to be sure that it is clear. Similarly, the cover gasket has a front vent hole and, to simplify assembly, it is marked "Front."

Alignment of the Shifter Forks

With the transmission fully engaged in second gear, measure the clearance between the rear face of the synchro-clutch shift collar and the front face of the second speed gear. (See Fig. 48, page 24.) This distance should not be less than .028". If it is less, it means that either the shifter fork or the quadrant has been distorted and should be replaced.

> NOTE: *Prior to Serial Number K-140220, if* either *the shifter shaft or the fork needs replacement,* both must be replaced. *This is due to the fact that, starting with K-140220, new shifter forks and shafts were used. These new parts have larger pivots on the forks and correspondingly larger holes in the shafts—and the quadrants are forgings pressed onto steel shafts, whereas in the older series the quadrants were brazed onto the shafts. Since none of the older parts are being replaced for service, it means that if one new part needs replacement a complete new unit package will have to be installed. This is true of both the high and second shaft and fork and the low and reverse shaft and fork.*

REMOVING THE SPLINE SHAFT ASSEMBLY

The Shifter Shafts and Forks

On all 40 Series transmissions the shifting mechanism is not removed until after the spline shaft assembly has been taken out. However, it is necessary to drive the low and reverse shifter shafts toward the outside of the case to provide clearance for the spline shaft gears.

To get the low shifter fork out of the way, first remove the shifter shaft lever, nut and washer. Then remove them from the shafts. Drive the lock pin up from the bottom of the boss. (Refer to Fig. 2, page 4). Drive the shifter shaft toward the outside of the case with a brass drift. This will permit the low and reverse sliding gear to pass the low shifter fork.

The Countershaft and Gear

Remove the four cap screws that hold the rear bearing cap to the transmission case . . . then turn the bearing cap in a clockwise direction until the countershaft lock is exposed. Drive this lock up and out with a small punch. Then, using countershaft aligning tool J-1413 tap the countershaft out from the front to the rear (Fig. 29). This will allow the countershaft gear to drop to the bottom of the case on the small diameter of the aligning tool.

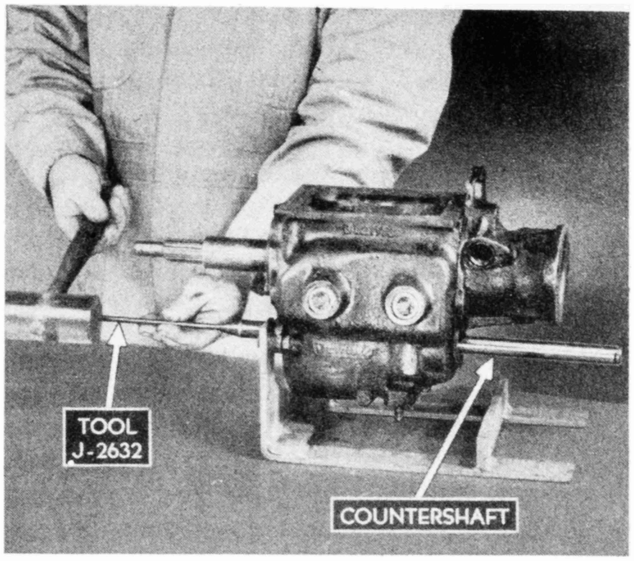


Figure 29—On the 40 Series, Tool J-2632 is used to tap the countershaft out through the rear of the case.

REMOVING THE CLUTCH SHAFT ASSEMBLY

Remove the three cap screws that hold the front bearing cap to the transmission case. Then remove the bearing cap.

> *Notice that this cap is recessed at the bottom to allow any lubricant that passes the bearing to drain back into the transmission.*

The clutch shaft and bearing are removed from the front of the case. At the same time, remove the front friction ring through the top of the case.

Remove the snap ring that retains the bearing on the clutch shaft, and press the bearing from the shaft (Fig. 30).

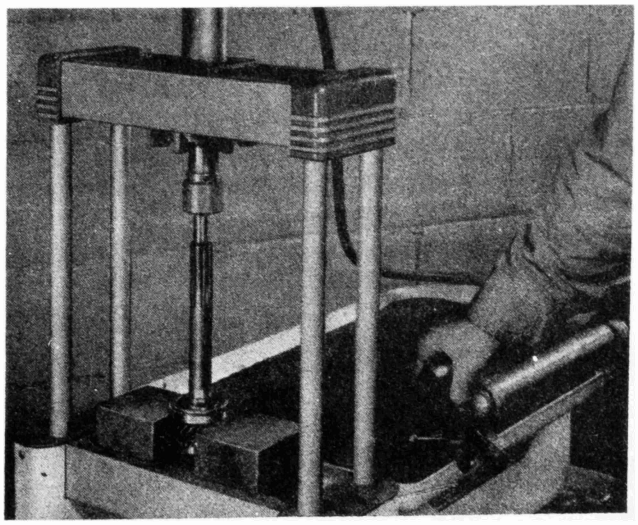


Figure 30—After the snap ring is removed, the front bearing can be pressed off the clutch shaft.

The large lock ring on the outside of the bearing need not be removed unless the bearing is to be replaced. There is only one ring thickness (.077″) used at this point.

The Roller Bearing

The bearing rollers inside the end of the clutch shaft should be checked for looseness and wear by jarring the shaft lightly against a block of wood. (See page 7, Fig. 12.)

The Spline Shaft and Gear Assembly

With the low shifter fork and shaft driven toward the outside of the case, the rear bearing cap, spline shaft and gears can be removed as a unit through the rear of the case (Fig. 31).

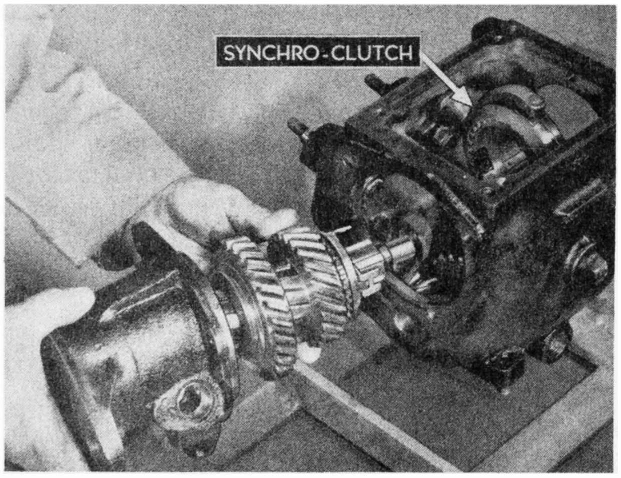


Figure 31—As the spline shaft assembly is removed from the 46-4740 Series transmission, the synchro-clutch remains with the shifter fork in the case.

As the spline shaft assembly is removed from the case, the synchro-clutch will slide off the shaft and be held in the case by the shifter fork. After the shaft has been removed, turn the synchro-clutch at right angles and remove it from the shifter fork.

NOTE: *The shoes will drop out of position as the clutch is removed. Take them off the shifter fork.*

REMOVING THE GEARS FROM THE SPLINE SHAFT

The Clutch Ring Driver

Remove the clutch ring driver as shown in Fig. 32.

As you remove it, note the position of this driver. The short prongs of the driver are to the rear, which lock the second speed gear thrust washer to the spline shaft.

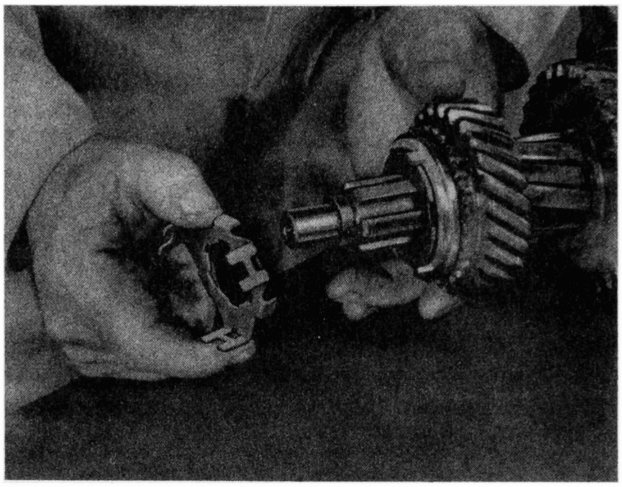


Figure 32—The short prongs of the clutch ring driver are to the rear.

The Second Speed Gear Thrust Washer

This is a splined washer which must be turned to line up with the grooves in the spline shaft before it can be removed.

This will permit removal of the second speed gear and the low and reverse sliding gear.

The Rear Bearing and Bearing Cap

Remove the snap ring from the front of the rear bearing cap and drive the spline shaft toward the front with a brass drift. The rear bearing and speedometer gear will remain on the shaft (Fig. 33).

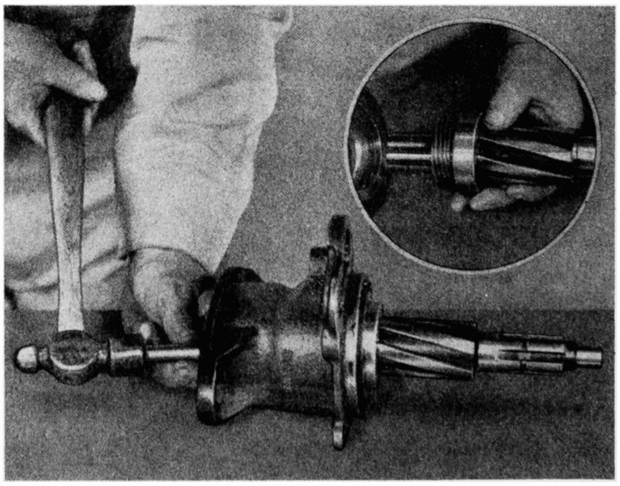


Figure 33—When the spline shaft is driven out of the bearing cap, the bearing and speedometer drive gear remain on the shaft.

Remove the spline shaft snap ring and the speedometer drive gear. (The speedometer drive gear is held in position with a Woodruff key.) Then press off the rear bearing after the key is removed.

The rear bearing cap oil seal can be driven out and replaced with a new seal (using driver J-1556).

REMOVING THE REVERSE IDLER GEAR

Use a long punch and drive the reverse idler gear shaft out through the rear of the case, being careful not to damage either the shaft or the case. Then lift the gear out through the top.

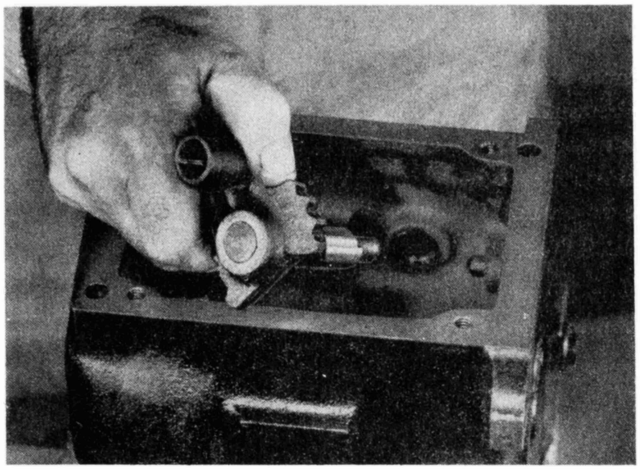


Figure 34—After the shifter forks have been removed, the shifter shafts can be removed from the inside of the case.

REMOVING THE SHIFTER SHAFTS AND FORKS

With the spline shaft out of the way, the high and low shifter forks can easily be removed from the shifter shaft quadrants. Remove the high gear shift lever and shaft lock pin. Now, both shifter shafts can be removed through the top of the case (Fig. 34).

The second and high shifter shaft pivots on two needle bearing assemblies. Examine them to see if they need replacement. If they do, drive them out with a punch.

Remove the two speed finder poppets from the transmission case. The high and second speed gear poppet is in front of the high speed shifter shaft quadrant. Removing the plug at the bottom of the case (beneath the low speed shifter shaft quadrant) will allow the low speed finder poppet and spring to be removed. Remove the interlock poppet from the boss between the two shifter shafts.

That completes the disassembly of the shifting mechanism.

REMOVING THE COUNTERSHAFT GEAR

Remove the countershaft gear and thrust washers.

CLEANING AND INSPECTING PARTS

Subject every part of the transmission to a thorough cleaning and inspection as detailed on page 8.

ASSEMBLING THE TRANSMISSION

When all parts have been cleaned and inspected, and any new parts to be used have been carefully tested, you're ready to reassemble the transmission.

INSTALLING THE REVERSE IDLER GEAR

> NOTE: *The low and reverse shifting shaft must be installed in the transmission case before the reverse idler gear is installed. This is the shaft with the smaller quadrant.*

Install the reverse idler gear with the beveled side of the gear teeth toward the front. Then drive the reverse idler gear shaft in from the rear.

> NOTE: *The notch for the shaft lock should be toward the rear and pointing in the direction of the countershaft. That way the shaft won't have to be turned after it has been installed.*

Drive the shaft in until the notch for the shaft lock is flush with the case.

INSTALLING THE COUNTERSHAFT GEAR

Apply a heavy lubricant to the case side of the front thrust washer, and install the lip side of the washer so that it is lined up with the slot in the transmission case.

Lower the countershaft gear into the case with the large gear toward the front, being careful not to dislodge the thrust washer.

After the gear is in position, insert the rear thrust washer through the hole in the rear of the case.

Then insert the countershaft aligning tool (J-1413) with the large end of the tool toward the rear, allowing the countershaft gear to rest on the small diameter of the tool.

INSTALLING THE SHIFTER SHAFTS AND FORKS

Install the high and second speed shifter shaft needle bearing assemblies (Fig. 35).

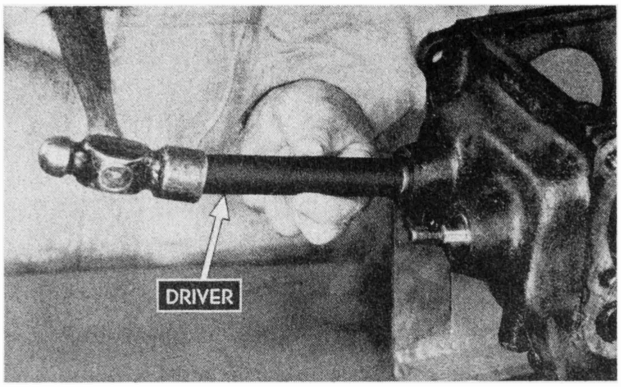


Figure 35—Use a driver to position the two high and second speed shifter shaft needle bearings.

Then put the interlock poppet in the hole in the boss of the case, being sure that it's free to move back and forth. Then put the second and high speed finder poppet in the case.

The Shifter Shafts

The second and high shaft (with the larger quadrant) goes toward the front. Press the second and high speed finder poppet into the case so that it will permit the shaft quadrants to contact the case, with the quadrants in a neutral position.

Install the low speed finder poppet and spring through the hole in the bottom of the case (Fig. 36). Then replace the plug.

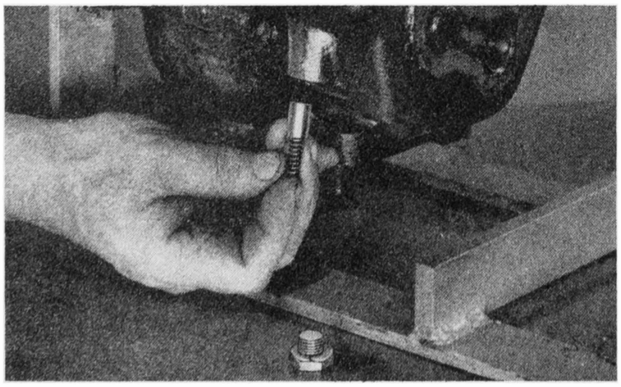


Figure 36—Install the low speed finder poppet from the outside of the case.

Install the large shifter fork in the high and second shifter shaft.

ASSEMBLING THE GEARS ON THE SPLINE SHAFT

The Rear Bearing and Cap

Press the rear transmission bearing (closed end forward) onto the spline shaft until it is tight against the shoulder of the shaft. Then place the Woodruff key in the shaft keyway, and install the speedometer drive gear on the shaft, tight against the rear bearing. Then install a snap ring just thick enough to fill the groove in the shaft (Fig. 37). (These rings come in three thicknesses—.087", .090" and .093".)

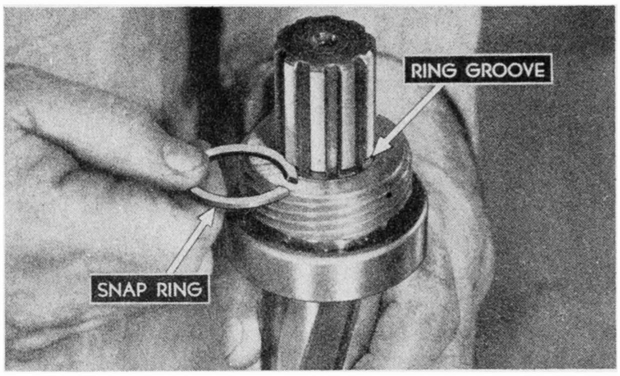


Figure 37—With the rear bearing and speedometer drive gear in place, install a snap ring just thick enough to fill the snap ring groove in the shaft.

With the bearing and speedometer gear locked in place, install the spline shaft through the front of the rear bearing cap. Be sure the bearing is firmly seated in the cap . . . then install the transmission rear bearing lock ring. This ring should fill the lock ring groove so that there is no end play in the spline shaft and bearing assembly (Fig. 38). These rings come in four thicknesses—.062", .065", .068" and .071".

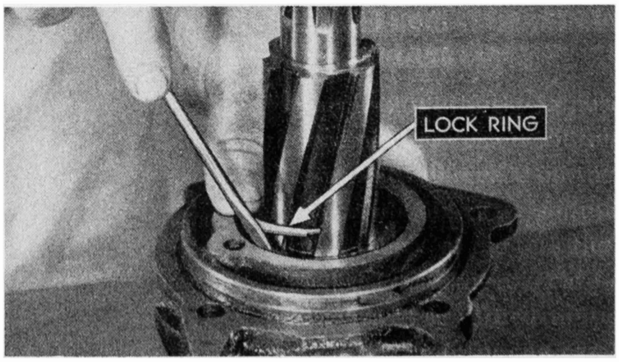


Figure 38—The correct lock ring thickness will eliminate all end play in the spline shaft and bearing assembly.

The Low and Reverse Sliding Gear

Install the low and reverse sliding gear on the spline shaft with the shifting collar to the rear. Make sure the gear slides freely on the splines.

The Second Speed Gear

Place the second speed gear on the shaft with the cone toward the front. Test this gear to be *sure* it revolves freely on the shaft.

This gear is locked on the shaft by the second speed gear thrust washer. Install this washer on the spline shaft, against the second speed gear and in a recess on the shaft. Then turn it one spline. This locks it in place (Fig. 39).

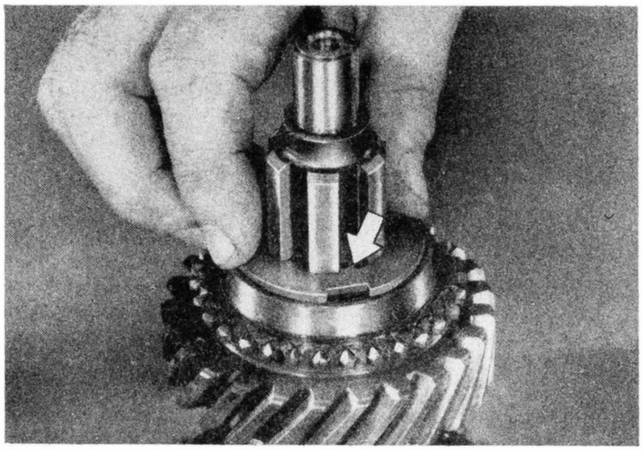


Figure 39—When you line up the splines on the thrust washer with the splines on the shaft, the second speed gear is locked on the shaft.

Second Speed Gear End Play

Insert a feeler gauge between the rear face of the second speed gear and the shoulder of the spline shaft (Fig. 40). This clearance should be between .002″ and .010″.

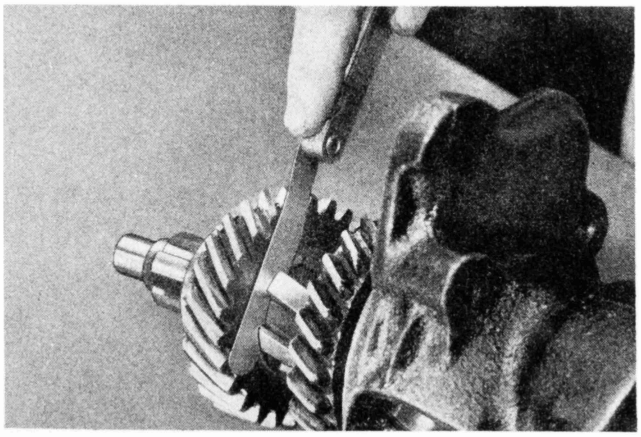


Figure 40—To measure second speed gear end play, use a feeler gauge between the gear and the shoulder on the spline shaft.

The Rear Friction Ring

With the second speed gear in place, install the rear synchro-clutch friction ring on the cone of the gear so that the prongs on the ring are toward the front.

The Clutch Ring Driver

The clutch ring driver is a splined stamping that must be installed with the short prongs pointing toward the second speed gear. As you install the driver, line up these prongs with the recesses in the second speed gear thrust washer (Fig. 41). This locks the washer to the shaft at the same time. Line up the prongs on the clutch friction ring with the slots in the driver.

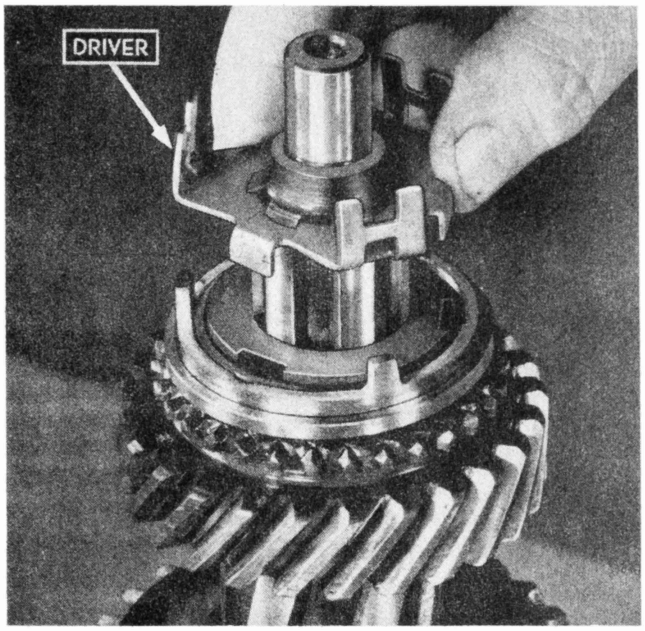


Figure 41—The clutch ring driver should be installed with the short prongs toward the second speed gear and lined up with the slots in the thrust washer.

INSTALLING THE SPLINE SHAFT ASSEMBLY

With the shifter forks in position (page 20) install the synchro-clutch in the high shifter fork. To do this, use heavy grease on the two shoes and install them on the high gear shifting fork shoe pins. Then turn the shoes of the fork the long way of the transmission. Place the synchro-clutch in the fork so that when it is turned the long end of the hub is toward the front of the case (Fig. 42). Hold it in this position while you insert the spline shaft assembly.

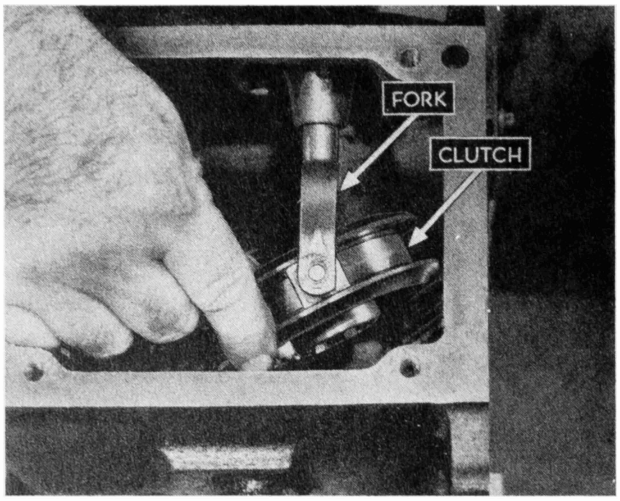


Figure 42—To install the synchro-clutch, place it in the fork and turn it so that the long end of the hub is toward the front. Then insert the spline shaft.

Now install the smaller shifter fork in the low and reverse shifter shaft, making sure that the flat side of the fork is to the rear.

The Synchro-Clutch

The synchro-clutch is of spring and ball type construction. It is made up of the hub, shifting collar, six balls and springs. The unit is serviced as an assembly. However, if the collar should be removed from the hub, it can be reassembled in the following manner. (Hub and collar should be marked before disassembly.) First, assemble the springs and balls in the hub. Then use a piston ring compressor to depress the balls against the spring in order to install the shift collar. The chamfered side of the collar goes toward the long end of the hub.

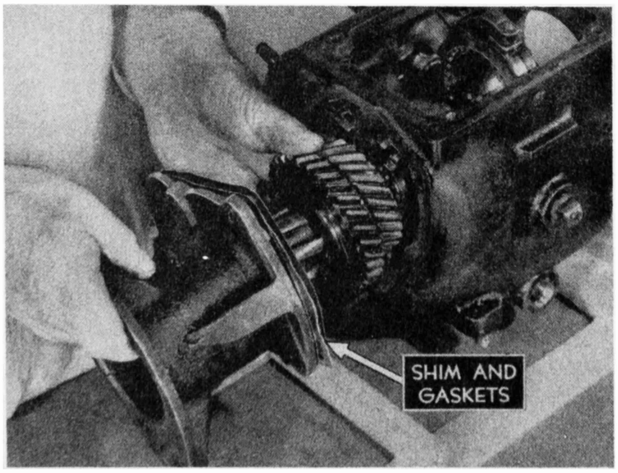


Figure 43 — The shim that determines friction ring clearance goes between the rear bearing cap and the case. Gaskets are placed on either side of the shim.

The Rear Bearing Cap Shims

Place a .010″ shim, with a gasket on each side of the shim, between the rear bearing cap and the transmission case (Fig. 43). *This is the shim that determines the clearance between the front friction ring and the main drive gear.* (This clearance will be inspected and adjusted after the assembly is completed.)

As you start to install the spline shaft in the case, move the low and reverse sliding gear forward on the shaft. Then work the shaft into the case and into the synchro-clutch assembly.

> *As you work the spline shaft forward in the case, rotate the synchro-clutch to line it up with the splines on the shaft. At the same time, be sure that the three recesses in the clutch hub line up with the three prongs on the clutch ring driver (Fig. 44).*

Line up the low and reverse shifting fork with the shifting collar on the low gear.

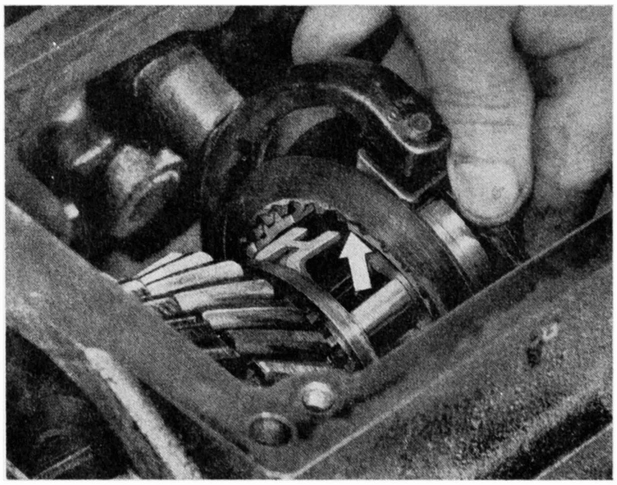


Figure 44—As you work the spline shaft into the case, line up the three recesses in the synchro-clutch hub with the three prongs on the clutch ring driver.

INSTALLING THE CLUTCH SHAFT ASSEMBLY

The Transmission Front Bearing

If the lock ring on the outside of the front ball bearing has been removed, or if a new bearing is being used, be sure to put a .077″ thickness lock ring in the bearing groove. Then press the bearing onto the clutch shaft (snap ring groove to the front) tight against the shoulder, and install a snap ring just thick enough to fill the groove in the shaft.

These snap rings comes in three thicknesses—.092", .095" and .098".

Clutch Shaft Rollers

There are thirteen rollers used in this clutch shaft. (See page 7.)

The Front Friction Ring

Before installing the clutch shaft assembly, install the front friction ring on the cone of the clutch shaft.

Then install the clutch shaft assembly in the case, lining up the prongs of the friction ring with the slots in the clutch ring driver (Fig. 45).

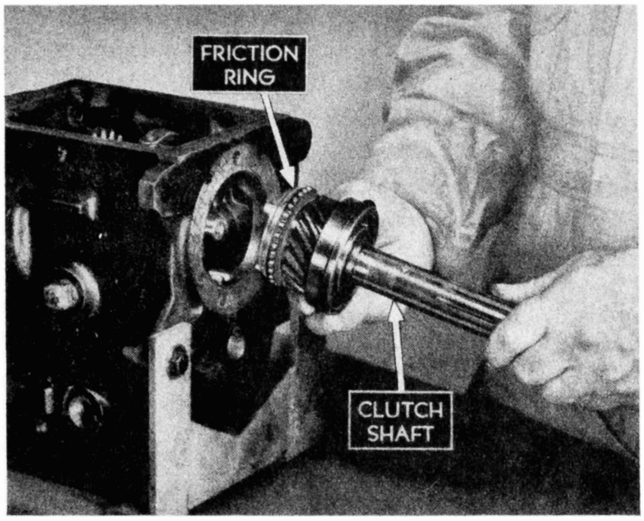


Figure 45—After the front friction ring is placed on the cone of the clutch shaft, install the clutch shaft assembly.

The Front Bearing Cap

With the clutch shaft in place, use a *new* gasket and install the bearing cap, lining up the oil return hole in the cap with the oil return hole in the case. Then replace the cap screws.

> CAUTION: *As you tighten up on the cap screws, notice whether the cap is pressing against the bearing first or against the transmission case first. If it presses against the bearing, insert additional gaskets between the cap and the case.*

INSPECTING CLUTCH AND SPLINE SHAFT CLEARANCES

Clutch Shaft End Play

End play in the clutch shaft is controlled by three factors—the depth of the counterbore in the front bearing cap, the thickness of the front bearing lock ring, and the thickness of the gasket used between the bearing cap and the transmission case. This end play should not be more than .005". .000 is preferred. (See page 11.)

Friction Ring Clearance

With the clutch and spline shafts assembled in the case, hold the rear bearing cap tight against the case and measure the clearance of the front friction ring with the friction ring clearance gauges (Tool J-1542) as shown in Fig. 46. This clearance should be .105". If it's less, add shims between the rear bearing cap and the case. If excessive, remove shims.

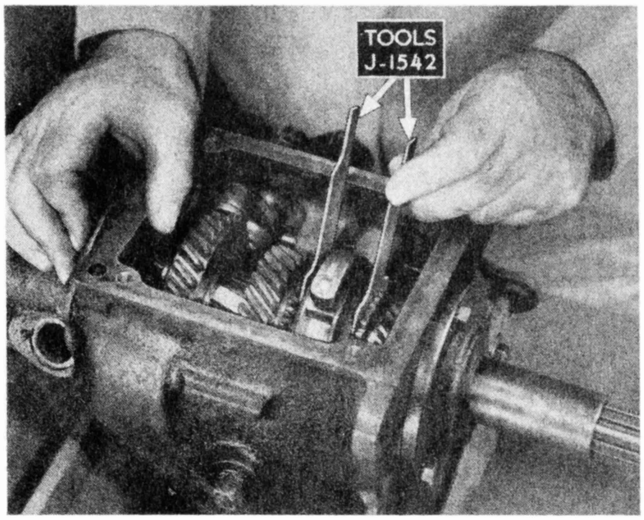


Figure 46—Gauging front friction ring clearance. It should be .105".

INSTALLING THE COUNTERSHAFT

When spline and clutch shaft clearances and adjustments have been made, you're ready to complete the assembly of the transmission.

Turn the transmission upside down so that the gear will drop into position and mesh with the clutch shaft gear, the second speed gear, and the reverse idler gear.

Be sure the thrust washers are seated in the notches in the case. Then with a fiber hammer tap the countershaft into position from the rear, holding the tool in constant pressure against the shaft as you tap it in. Be sure that the locking groove in the shaft will line up with the locking groove in the reverse idler gear shaft. Then tap the shaft in until the lock plate can be installed. Insert the lock plate between the two shafts and tap it into position (Fig. 47). If the plate shows any tendency to slip out, tap the ends of the two shafts just enough to bind the plate against the case.

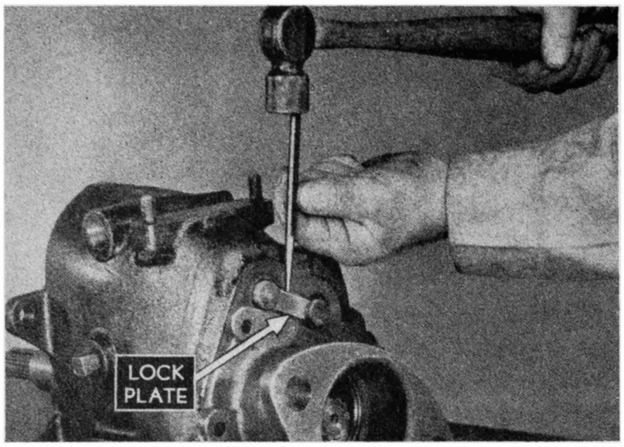


Figure 47—With the grooves in the reverse idler shaft and the countershaft lined up, tap the lock plate into position.

COMPLETING THE ASSEMBLY OF THE SHIFTING MECHANISM

Position the high and second speed shifter shaft toward the inside of the transmission until the lock pin can be inserted. Then drive the lock pin in from the top.

Line up the low and reverse shifter fork with the low and reverse sliding gear, and position the shifter shaft until the lock pin can be inserted. Drive the pin down from the top.

Install the shifter shaft oil seals using Tool J-2633). Then put on the shifting levers, the longer one at the front. Both levers should be installed so that they point down and forward when the gears are in neutral. Finally, put on the lockwashers and shifter shaft nuts. Tighten them securely.

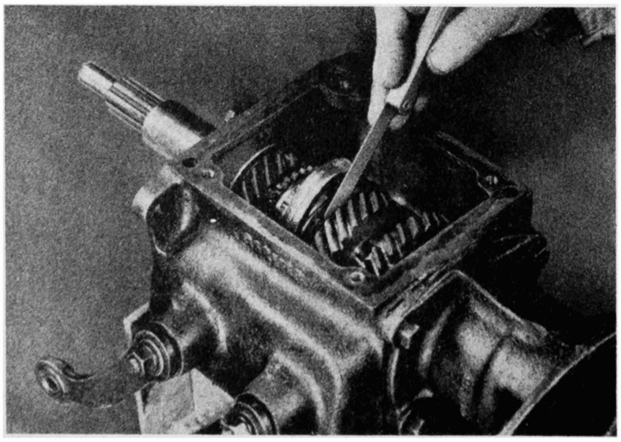


Figure 48—With the transmission in second gear, clearance between the synchro-clutch shift collar and the second speed gear should not be less than .028".

Alignment of the Shifter Forks

With the transmission fully engaged in second gear, measure the clearance between the rear face of the synchro-clutch shift collar and the front face of the second speed gear (Fig. 48). This distance should not be less than .028". If it is less, it means that either the shifter fork or the quadrant has been distorted and should be replaced.

> NOTE: *Prior to Serial Number K-140220, if* either *the shifter shaft or the fork needs replacement,* both must be replaced. *This is due to the fact that, starting with K-140220, new shifter forks and shafts were used. These new parts have larger pivots on the forks and correspondingly larger holes in the shafts—and the quadrants are forgings pressed onto steel shafts, whereas in the older models the quadrants were brazed onto the shafts. Since none of the older parts are being replaced for service, it means that if one part needs replacement a complete new unit package will have to be installed. This is true of both the high and second shaft and fork and the low and reverse shaft and fork.*

Before replacing the cover plate, shift the gears in all positions, turning the transmission clutch shaft to see if the gears mesh correctly and turn freely. Lubricate the bearings and thrust surfaces with engine oil.

Place the cover gasket on the case, with the vent hole toward the front. Then install the transmission cover in a similar manner, making sure that the vent hole is clear.

Bolt the cover down, and the assembly is complete.

Lubrication

After the unit has been assembled in the car, be sure to fill the transmission with the correct lubricant. (See lubrication chart, page 25.)

LUBRICATION OF THE TRANSMISSION

Check the lubricant level of the transmission and the overdrive every 2000 miles. Transmission and overdrive units should be filled to the drain plug level on the right side of both units. Drain and clean twice a year, or every 10,000 miles, using only flushing oils. Do not use gasoline, kerosene, steam, etc. For atmospheric temperatures above 32°F. use SAE oil No. 90 in the transmission and overdrive. Below 32°F. use SAE oil No. 80 in the transmission and overdrive. Where difficulty in shifting is experienced in sub-zero temperatures, dilute transmission and overdrive oil as required, using light engine oil.

Do not use gear oil with extreme pressure lubricants or other compounded agents.

LUBRICATION CHART—NASH TRANSMISSIONS AND OVERDRIVES

Standard	Capacity (U.S. Measures)	Including Overdrive	Capacity (U.S. Measures)
41-4240	1 pt.	41-4240	3 pts.
46-4740	2¼ pts.	——	——
41-4260-80	4 pts.	41-4260-80	6 pts.
46-4760	4 pts.	46-4760	6 pts.

SHIFTING SYSTEM SECTION

Nash
TECHNICAL
MANUAL

ADJUSTING THE SHIFTING MECHANISM 2

DISASSEMBLING THE SHIFTING MECHANISM 2

  REMOVING THE LIMITING PLATE 3

  REMOVING THE MAIN SHIFTER SHAFT AND UPPER BRACKET 3

ASSEMBLING THE SHIFTING MECHANISM 3

  INSTALLING THE SHIFTER SHAFT AND UPPER BRACKET 3

  INSTALLING THE STABILIZER BRACKET ASSEMBLY 3

  ADJUSTING THE LIMITING PLATE 4

  LUBRICATING THE SHIFTING MECHANISM 4

SHIFTING SYSTEM SECTION
NASH TECHNICAL MANUAL

(40, 60, 80 Series)

ADJUSTING THE SHIFTING MECHANISM

Place the manual shift lever in a neutral position (Fig. 1). This will bring the two main shifting levers into the correct position with the stabilizer bracket so that the aligning tool (J-1390) can be inserted in the small holes in the levers and the bracket (Fig. 2).

Loosen or disconnect the transmission gear shift lever rods at the transmission, and place the transmission shift shaft levers in a neutral position.

With the aligning tool in position and the transmission shift levers in neutral, adjust the shifting rods at the transmission end. After the rods have been adjusted and again connected to the transmission, remove the aligning tool.

CAUTION: *Be sure not to move the transmission levers out of the neutral position as the adjustment is being made.*

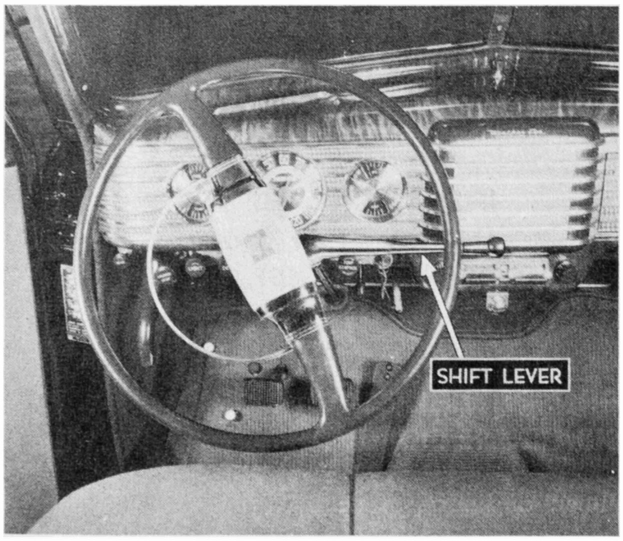


Figure 1—To adjust the shifting mechanism, place the steering gear shift lever in a neutral position.

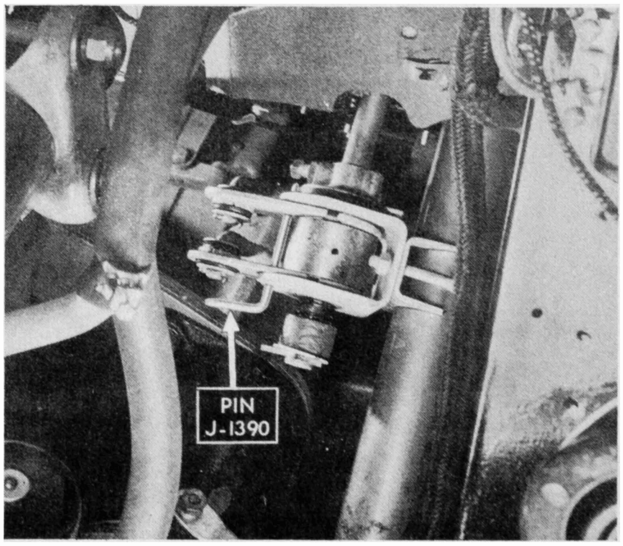


Figure 2—Aligning pin (J-1390) is used to adjust the shifting mechanism with all rods in the neutral position.

DISASSEMBLING THE SHIFTING MECHANISM

If it should be necessary to remove the steering post shifting mechanism, first disconnect the transmission shift rods at the steering column. Then take out the cotter pin at the lower end of the main shift shaft and remove the lower washer, rubber sleeve, pull-down spring, and upper washer.

Remove the stabilizer bracket U-bolt and lift the locating dowel out of the steering column. The stabilizer bracket assembly can be worked down from the shift shaft, by rotating the shift lever assembly until the selector key lines up with the notch in the bracket. This assembly will include the bracket, lower fiber washer, the second and high shifting lever, the separator spring and sleeve, the first and reverse lever and the upper fiber washer (Fig. 3).

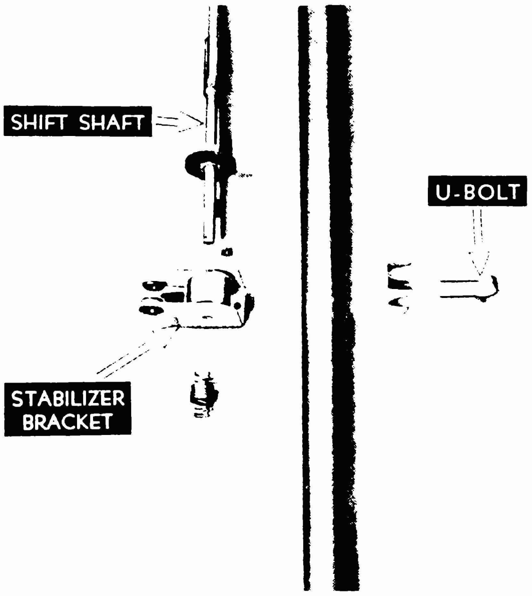


Figure 3—Remove the stabilizer bracket assembly from the lower end of the shifter shaft.

REMOVING THE LIMITING PLATE

To remove the limiting plate and washer, loosen the limiting plate set screw and remove the limiting plate and washer from the lower end of the shifter shaft.

NOTE: *Prior to the 4600 Series, it is necessary to remove the selector key from the shift shaft before removal of the limiting plate.*

REMOVING THE MAIN SHIFTER SHAFT AND UPPER BRACKET

Remove the gear shift lever by removing the fulcrum screw and pin.

Loosen the spring loaded clamp screw on the upper bracket. This will allow the upper bracket bearing hub to be removed.

The main shaft upper bracket is held to the jacket tube by two cap screws. These screws are threaded into a split ring on the inside of the jacket.

CAUTION: *Care must be used when removing the upper bracket cap screws to prevent the split ring from being displaced.*

Remove the top screw and loosen the bottom screw, then insert a small drift in the upper screw hole to retain the split ring in its position. Remove the other cap screw and the bracket. Replace this cap screw to retain the ring in position. Now the main shift shaft and bracket can be removed.

ASSEMBLING THE SHIFTING MECHANISM

INSTALLING THE SHIFTER SHAFT AND UPPER BRACKET

With the bearing hub installed on the shifter shaft, assemble the upper bracket to the bearing, applying a light coat of lubriplate to the shaft and threaded section of the bearing hub. The bearing hub should be threaded in the bracket so that when the shift lever is installed a clearance will be maintained between the shift lever and bracket in the low and reverse position. Install the main shift shaft and bracket assembly.

Remove the cap screw from the tube jacket that holds the split ring in position and insert this screw through the bracket (threaded end of the bracket up). Install the bracket onto the jacket with this one screw. Then remove the drift and install the bracket in position, tightening the cap screws.

Replace the shifting lever and install the fulcrum screw and lock nut.

INSTALLING THE STABILIZER BRACKET ASSEMBLY

The Limiting Plate

Replace the limiting plate on the shifter shaft with the set screw end up, then install the rubber washer with the flat side down. (Adjustments to this limiting plate will be made when the shifting mechanism is complete.)

The Stabilizer Bracket

To assemble the stabilizer bracket install the spring and sleeve between the shift levers. Place the fibre washers between the levers and the bracket, locating the projection of the washer in the notches of the levers. Apply a light coat of "Lubriplate" on all friction areas.

As the stabilizer bracket assembly is being installed, rotate the assembly, lining up the slots in the bracket and levers with the selector key.

NOTE: *On cars prior to 4600 Series, it will be necessary to install the selector key in the slot on the shifter shaft.*

Install the stabilizer bracket on the jacket tube, making sure the locating tongue on the bracket registers with the hole in the tube. Tighten the stabilizer bracket clamp bolt.

Install the upper washer, pull-down spring, rubber cover, lower washer and cotter key to the lower end of the shifter shaft.

ADJUSTING THE LIMITING PLATE

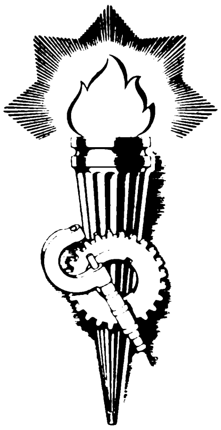
To adjust the limiting plate, engage the selector key with the second and high shifter lever, then raise the main shaft slightly to provide clearance. Tighten the set screw on the limiting plate in this position.

CAUTION: *The limiting plate should be adjusted on the shift shaft so that the selector key will not rub against the lower inside surface of the stabilizer bracket. Install the transmission shifter rods and adjust according to the adjustment procedure on page 2.*

LUBRICATING THE SHIFTING MECHANISM

Spread "Lubriplate" over all surfaces around the stabilizer bracket that slide against each other. Also put "Lubriplate" on the fulcrum pin on the shifting lever.

OVERDRIVE SECTION



Nash

TECHNICAL MANUAL

THE FORTY-SIX AND FORTY-SEVEN SERIES

DISASSEMBLING THE OVERDRIVE 3

ASSEMBLING THE OVERDRIVE 8

THE OVERDRIVE CONTROL SYSTEM 11

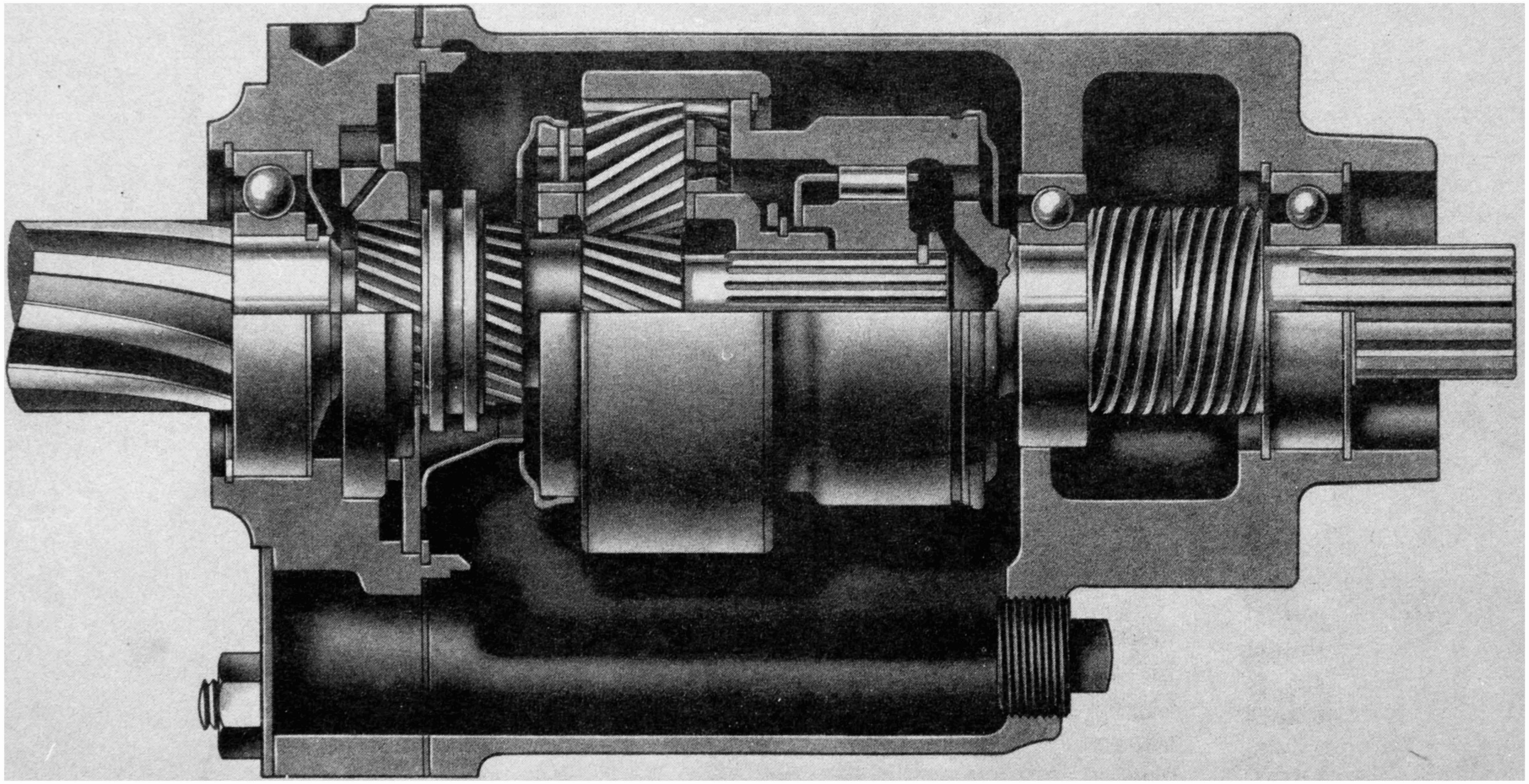
DIAGNOSING OVERDRIVE TROUBLES 14

●

THE FORTY-ONE, FORTY-TWO AND FORTY-SIX SERIES

SERVICING THE OVERDRIVE 15

THE NASH OVERDRIVE 4760 SERIES



OVERDRIVE SECTION
NASH TECHNICAL MANUAL

GOVERNOR CONTROLLED OVERDRIVE — 46-4700 SERIES INSTALLED ON 4600 SERIES CARS ABOVE N6-120026 AND 4760 SERIES—OPERATION PROCEDURE

The overdrive is a unit which acts as an automatic fourth speed forward.

When overdrive operation is desired, the control button is pushed to the forward position. The car speed is then increased to a point higher than the cut-in speed which is determined by the point setting of the overdrive governor.

As these points close, at approximately 22-25 miles per hour, the solenoid is energized and allows the locking pawl to engage the stationary gear plate and balk ring assembly when the accelerator is momentarily released. When the accelerator is again depressed, the overdrive is in operation. When this takes place, free wheeling becomes inoperative as free wheeling is possible only below the cut-in speed determined by the overdrive governor.

The overdrive unit operates to reduce the engine to rear axle ratio approximately 30%.

To lock out the overdrive, the control button must be pulled all the way out. This can be done either while the car is parked or driving on the road.

Locking out the overdrive while the car is in motion must be done while the car is in the free wheeling position. The accelerator is depressed so that the engine is driving the car, overcoming free wheeling, and the control button is pulled out without depressing the clutch. While still applying pressure to the control button, the accelerator should be momentarily released to complete the shift.

An alternate method permits pulling the control button back into conventional position during the time the accelerator pedal is fully depressed in the overtake position.

THE FORTY-SIX AND FORTY-SEVEN SERIES
(46-4760)

◆

DISASSEMBLING THE OVERDRIVE

The transmission and overdrive are removed from the car as a unit. However, it isn't necessary to disassemble the transmission in order to disassemble the overdrive. The only time when it's necessary to take down both units is when the transmission main drive shaft or the bearing in the adapter needs replacement.

REMOVING THE CONTROLS

With the transmission and overdrive assembly drained of its lubricant and set up in a transmission stand, the first thing to do is remove the lock-out switch from the rear of the overdrive. Then remove the governor (Fig. 1) and the speedometer drive unit from the case.

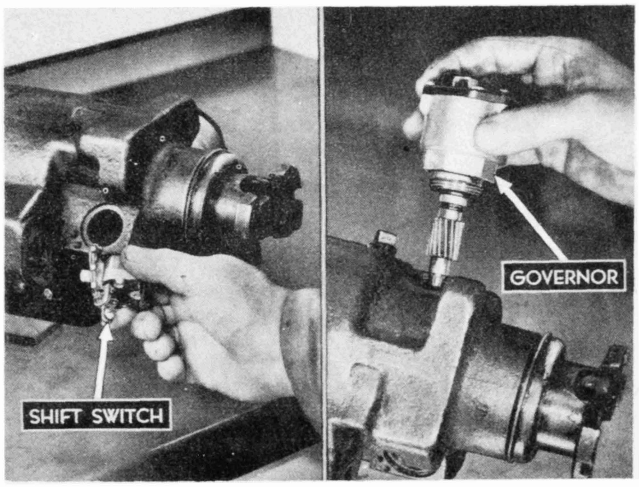


Figure 1—Remove the shift switch and the governor.

Use the special pulling tool (J-1375) to remove the companion flange from the rear of the overdrive case.

DISENGAGING THE SHIFT SHAFT

Drive out the lock pin that holds the overdrive shift shaft in the overdrive case (just as detailed in the Transmission Section of this manual, page 4, Fig. 2).

Take hold of the shift lever and pull the shaft out from the case about 3/8 of an inch. Do this with a turning action so as to disengage the shaft from the shift rail.

REMOVING THE OVERDRIVE CASE

Take out the cap screws that hold the overdrive case to the transmission. Then separate the overdrive from the transmission at the *rear* of the overdrive rear bearing adapter.

> Do *not* separate the overdrive rear bearing adapter from the transmission case. As soon as the overdrive has been pulled far enough away from the transmission case to provide clearance, insert a holding bolt through the bearing adapter and bolt it to the transmission.

As you remove the overdrive case, keep tapping the end of the main shaft with a soft hammer (Fig. 2). This will keep the shaft from coming out and prevent the free wheeling rollers from dropping into the case.

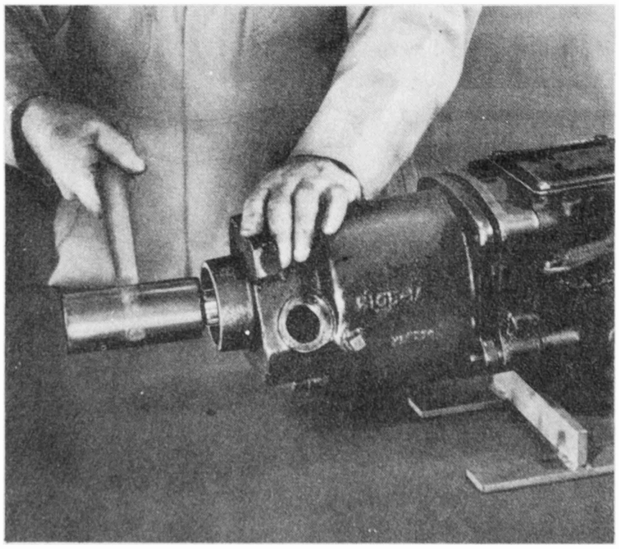


Figure 2—To keep the free wheeling rollers from falling out, tap the main shaft with a soft hammer as you remove the overdrive case.

REMOVING THE LOCK-OUT SPRING AND SHIFT SHAFT

With the overdrive separated from the transmission, remove the shifter shaft spring from the inside of the case. Then remove the shifter lever and shaft. Take out the oil seal and discard it. A new one will be used on reassembly.

REMOVING THE MAIN SHAFT BEARINGS

Drive the front one of the two rear bearings out the forward end of the overdrive case, using a brass drift inserted through the rear bearing. Then remove the governor drive gear and speedometer drive gear (Fig. 3).

Remove the rear bearing oil seal. Remove the rear snap ring and drive the bearing out through the rear of the case. Then remove the inner snap ring.

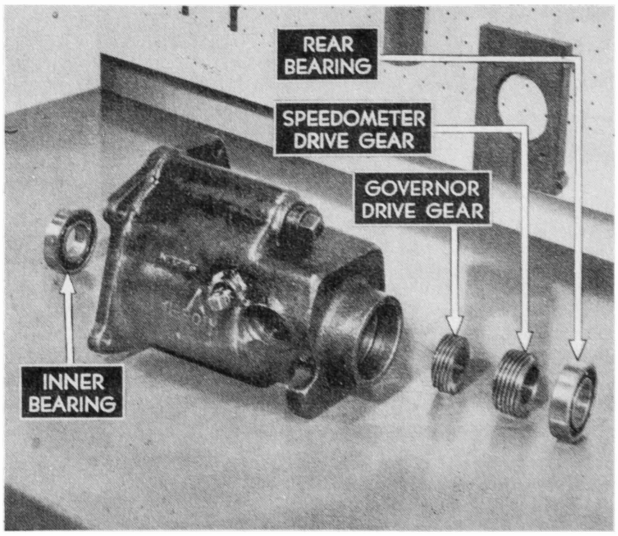


Figure 3—When the overdrive main shaft front bearing has been removed, you can take out the governor drive gear and the speedometer drive gear.

REMOVING THE MAIN SHAFT AND RING GEAR

Remove the overdrive main shaft and ring gear (Fig. 4). As the overdrive main shaft is being removed, the rollers will drop out, so keep one hand underneath to catch them.

To remove the ring gear from the main shaft, just remove the large ring gear snap ring. The gear will then separate from the main shaft.

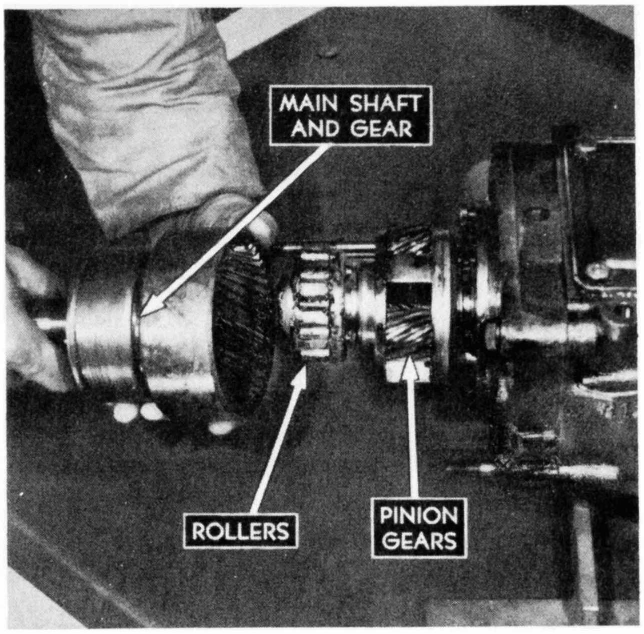


Figure 4—After the case has been removed from the overdrive, pull the main drive shaft and ring gear off the pinion gears, and remove the rollers.

REMOVING THE CAM AND PINION CAGE

To remove the cam and pinion cage from the spline shaft, take out the cam retaining clip with a screw driver (Fig. 5).

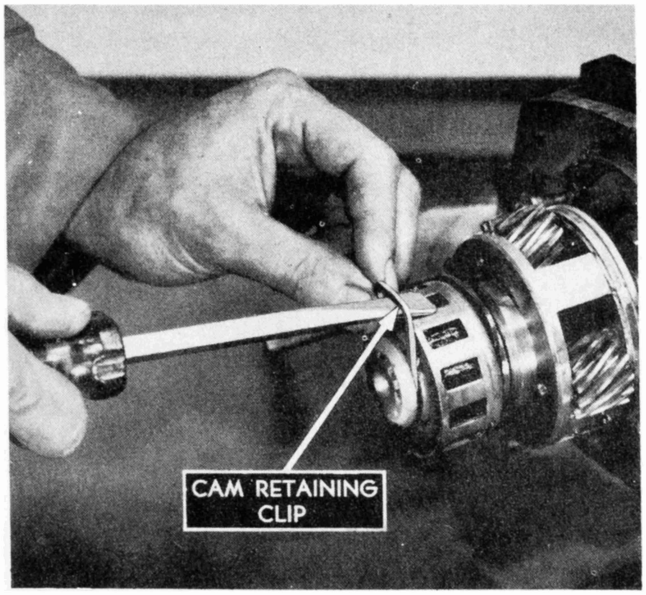


Figure 5—To get the cam and pinion cage off the spline shaft, remove the cam retaining clip.

The cam can then be separated from the pinion cage by removing the pinion cage retaining clip (Fig. 6) (also with a screw driver) and separating the two units.

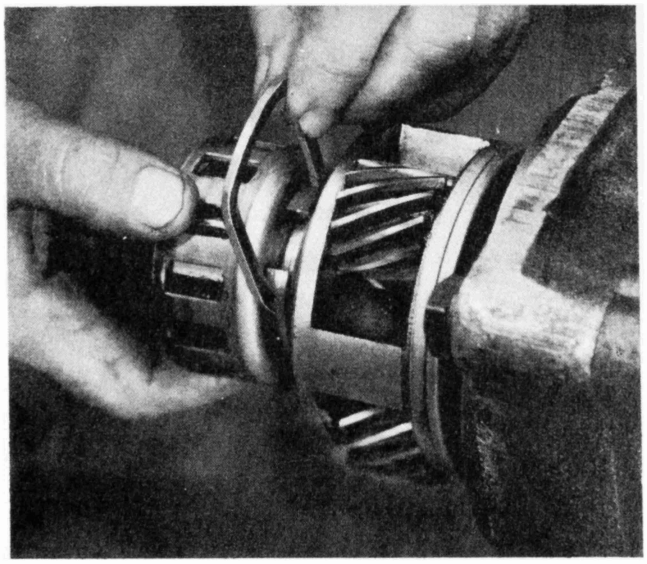


Figure 6—The cam can be separated from the pinion cage by removing the pinion cage retaining clip and sliding the cage off the spline shaft.

REMOVING THE SUN GEAR AND SHIFTER ROD ASSEMBLY

To remove the overdrive shifter rod and sun gear and collar, just remove them from the spline shaft as a unit (Fig. 7). When the sun gear is free of the shaft, the shifter rod can be separated from the sun gear shifting collar.

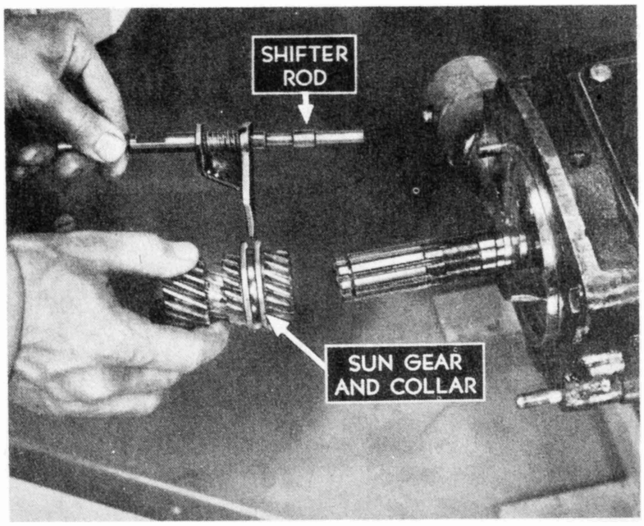


Figure 7—The overdrive shifter rod and the sun gear and collar can be removed from the spline shaft as a unit.

REMOVING THE SOLENOID

Take out the two cap screws that hold the solenoid to the rear bearing adapter. Turn the unit one quarter turn clockwise to release the solenoid plunger from the overdrive locking pawl. Then the solenoid can be removed (Fig. 8).

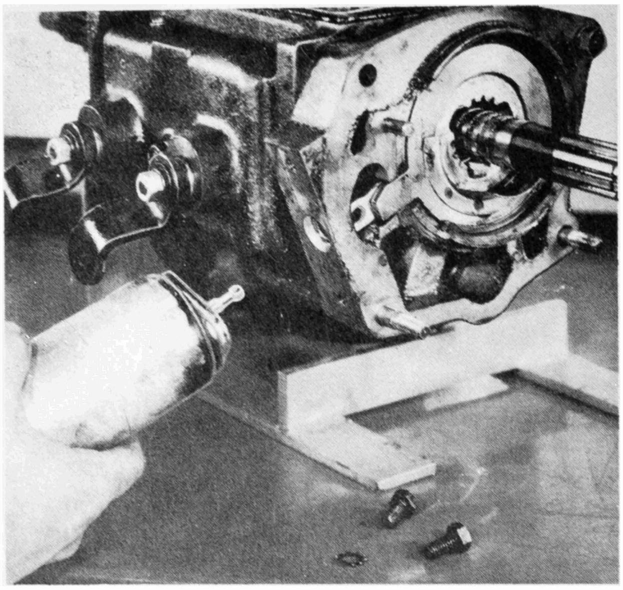


Figure 8—Remove the overdrive solenoid by taking out the cap screws, turning the unit one quarter turn clockwise, and pulling it out.

REMOVING THE COVER PLATE, GEAR PLATE AND PAWL

Using a pair of pliers, remove the large snap ring that holds the sun gear cover plate, the stationary gear plate and the overdrive balk ring in place (Fig. 9).

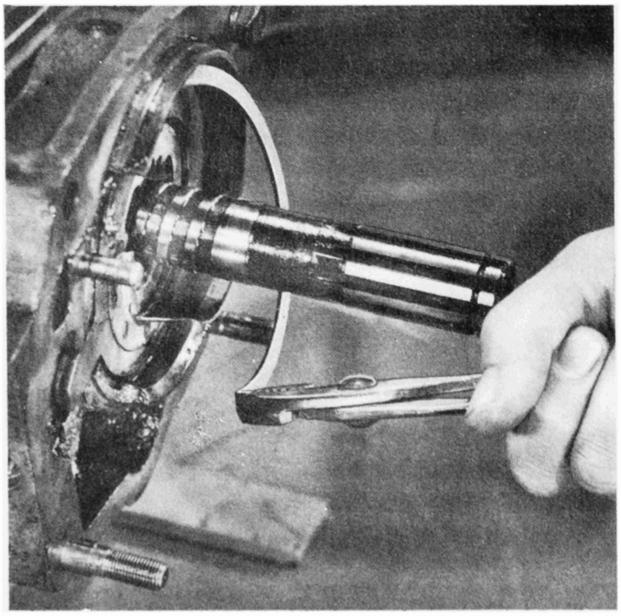


Figure 9—Using a pair of pliers, remove the snap ring that holds the cover plate and stationary gear plate to the bearing adapter.

Remove the cover plate and trough assembly and the gear plate. Then you can lift out the overdrive locking pawl (Fig. 10).

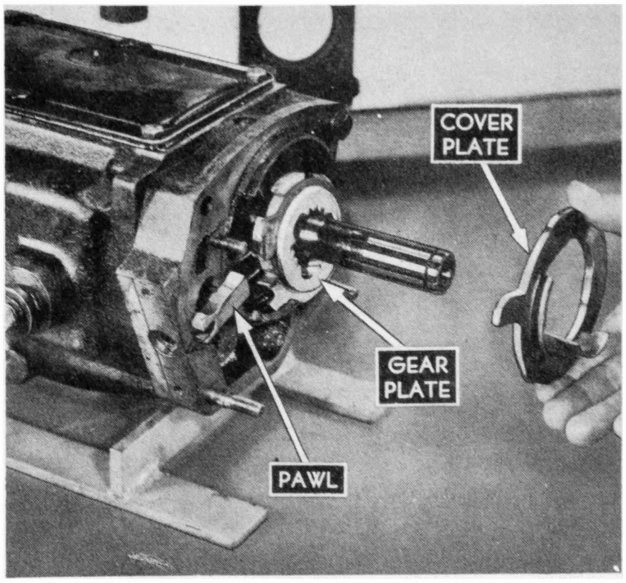


Figure 10—Removing the cover plate assembly allows the stationary gear plate to be removed. Then you can take out the solenoid locking pawl.

REMOVING THE SPLINE SHAFT AND BEARING ADAPTER

Normally, when the locking pawl has been removed, the overdrive is completely disassembled. However, if for any reason the transmission spline shaft or the rear bearing adapter must be removed, remove the bearing plate and the spline shaft with the gears and synchro-clutch as an assembly (Fig. 11), just as you would in disassembling the transmission itself. (See Transmission Section, page 5.)

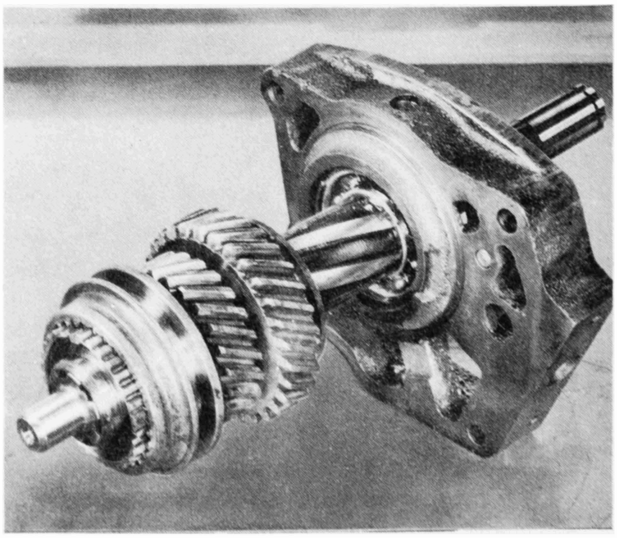


Figure 11—To remove either the bearing adapter or the spline shaft, it is necessary to remove the entire spline shaft assembly.

Remove all the gears from the shaft. Then remove the large snap ring from the transmission side of the rear bearing adapter (Fig. 12) and press the spline shaft and bearing out of the bearing plate. While you're doing this, be careful not to damage the oil baffle.

Finally, remove the bearing snap ring and press the bearing off the shaft.

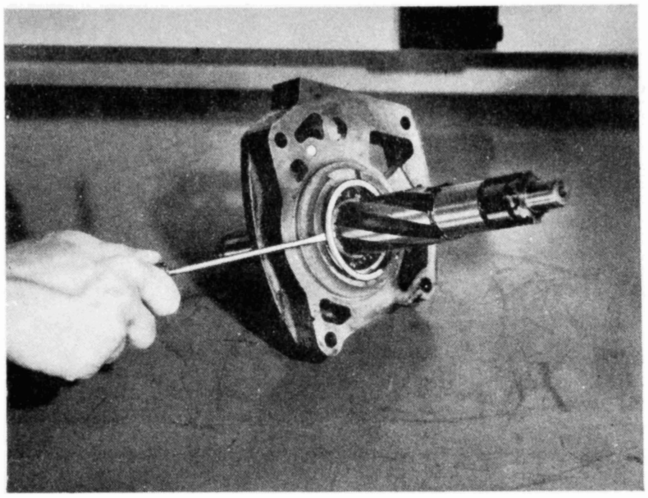


Figure 12—Removing the large snap ring in the bearing adapter permits the spline shaft and bearing to be removed from the adapter.

INSPECTING PARTS

There are no internal adjustments to be made in Nash overdrives. The one thing you *can* do to be certain of good operation is to inspect every part carefully to be sure they're all in excellent condition. If they are up to standard and assembled correctly, you can be sure the unit will operate correctly.

Pinion Cage and Gears

Examine the pinion gears in the planetary pinion cage for worn, cracked or chipped teeth. Rotate each gear to see that it does not bind on the pinion shaft. Then examine the oil slinger which is a part of the pinion cage. This slinger supplies lubrication to the pinion gears and, if it is bent or otherwise damaged, it will not operate efficiently.

Stationary Gear Plate and Balk Ring

Test the fit and tension of the balk ring on the hub of the stationary gear plate. When you apply pressure on the end of the ring in a direction that tends to spread or open the ring, it should slide around the hub. But when you apply pressure in a direction that tends to close the ring, it should bind against the hub so that it won't turn (Fig. 13).

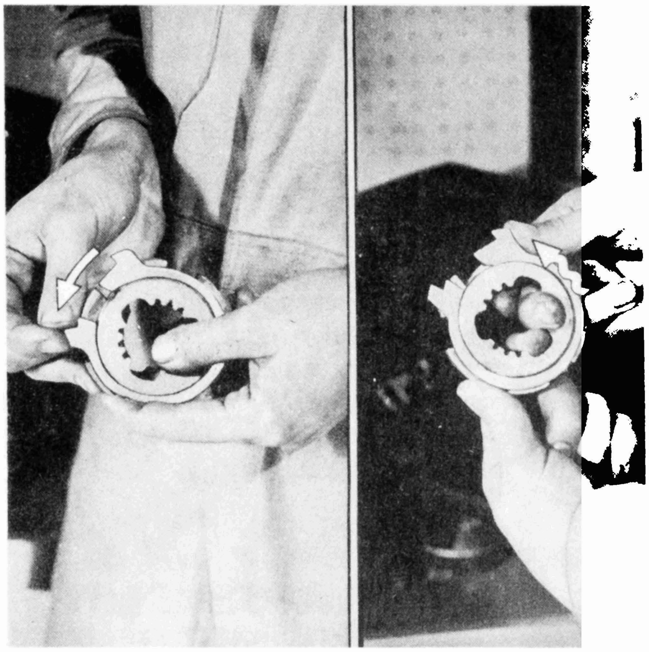


Figure 13—Testing balk ring tension. Left: When you push one end of the ring away from the other, the ring should slide around the stationary gear plate. Right: When you push one end toward the other, the ring should grab and hold.

Free Wheeling Rollers and Housing

Examine each of the free wheeling rollers and the overdrive main shaft housing in which they turn for wear, scoring, rough surfaces or any indications that the rollers may be slipping in the housing (Fig. 14).

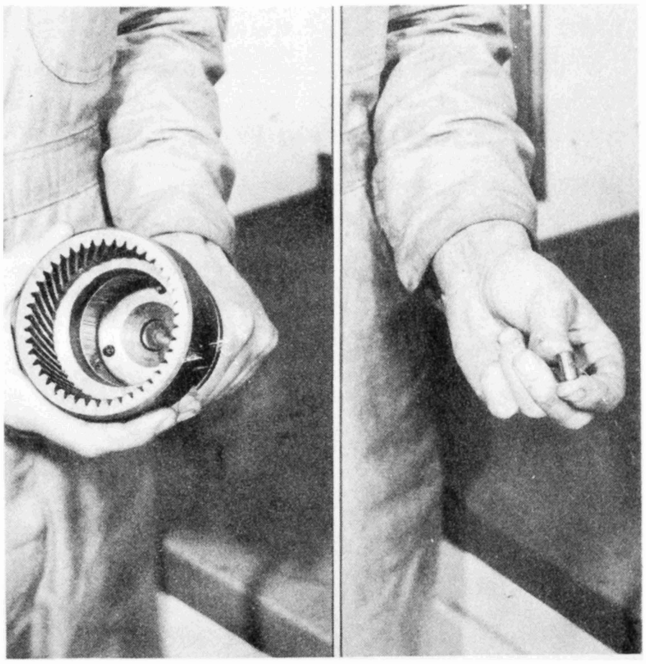


Figure 14—Inspection of overdrive parts in important. A worn main shaft housing, like that above, allows the free wheeling rollers to slip.

The Cam Assembly

Inspect the roller cams on the free wheel hub for wear or a grooving condition.

Then test the action of the two cam retaining springs. These springs are designed to twist the cam in a clockwise direction—thus holding the rollers up on the cam. If this spring action is slow or retarded, it will result in a loud thump whenever the free wheeling unit engages on acceleration. To test it, grasp the cam roller retainer (Fig. 15) and turn it counter-clockwise. Then release it suddenly. If the retainer springs quickly back in a clockwise direction, the springs are all right. But if the action is sluggish, replace the springs.

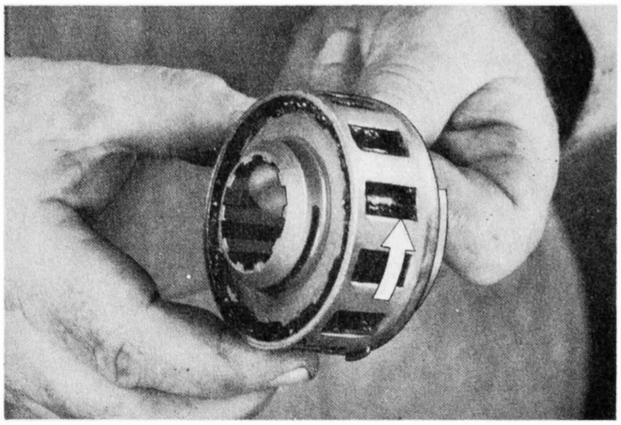


Figure 15—When you twist the cam roller retainer counter-clockwise, the two retainer springs should snap it back quickly.

ASSEMBLING THE OVERDRIVE

When all parts have been inspected carefully, you're ready to reassemble the unit. As you place each part in place, be sure it's absolutely clean and lubricated with light engine oil. And be sure to use all new gaskets and oil seals.

INSTALLING THE SPLINE SHAFT AND BEARING ADAPTER

Press the bearing onto the spline shaft, and lock it in place with the small snap ring.

Place the oil baffle in the bearing adapter, with the lip of the baffle toward the overdrive case.

Then press the spline shaft and bearing into the bearing adapter, and lock them together with the large bearing snap ring (Fig. 16).

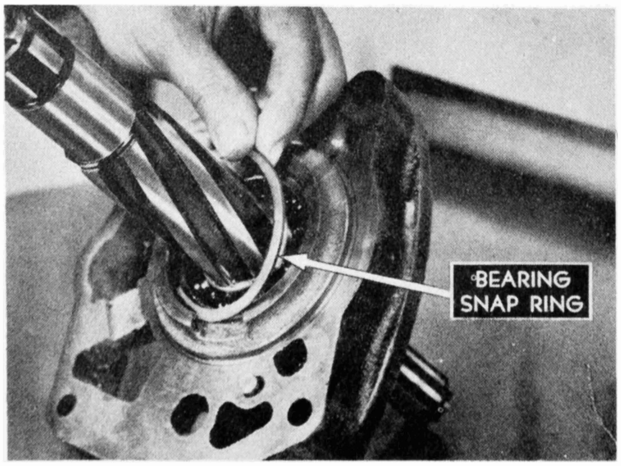


Figure 16—Place the oil baffle in position. Then press the spline shaft and bearing into the adapter, locking them in place with the snap ring.

Finally, following the instructions in the Transmission Section, page 11, replace all the gears on the spline shaft and install the spline shaft and bearing adapter assembly in the transmission. Install a cap screw to hold it in place temporarily.

NOTE: As you install the bearing adapter and spline shaft, line up the shifter rod in the bearing adapter and the transmission case.

INSTALLING THE PAWL, GEAR PLATE AND COVER PLATE

Place the overdrive locking pawl in position with the recess up. Then install the stationary gear plate and balk ring.

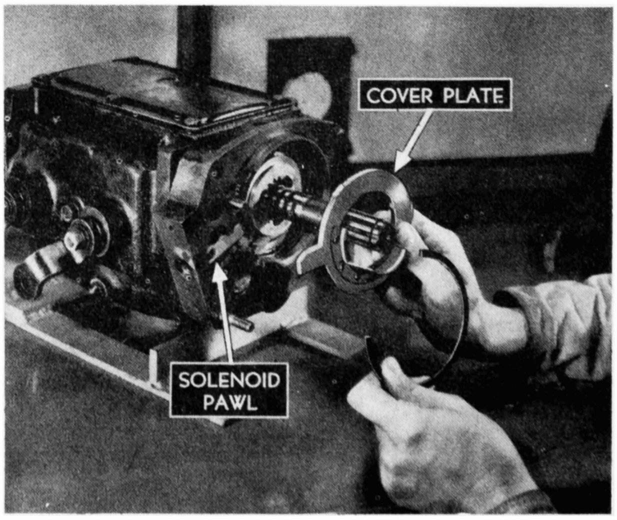


Figure 17—As you put on the cover plate and trough, be sure the pawl is in the "locked out" position—on the step of the balk ring.

NOTE: The balk ring should be fitted onto the gear plate hub with the chamfered side of the ring against the gear plate.

Position the pawl and balk ring in the "locked out" position—with the pawl on the step of the ring as in Fig. 17—for correct installation of the solenoid. Then install the cover plate and trough in position and lock it in place with the large snap ring.

INSTALLING THE SOLENOID

Place a new gasket over the face of the solenoid, insert the solenoid plunger in the opening in the bearing adapter and engage it with the notch in the locking pawl. Turn the solenoid one quarter turn counter-clockwise to lock the pawl and plunger together (Fig. 18). Pull the solenoid to be sure the plunger is locked with the pawl. Then install the two cap screws loosely.

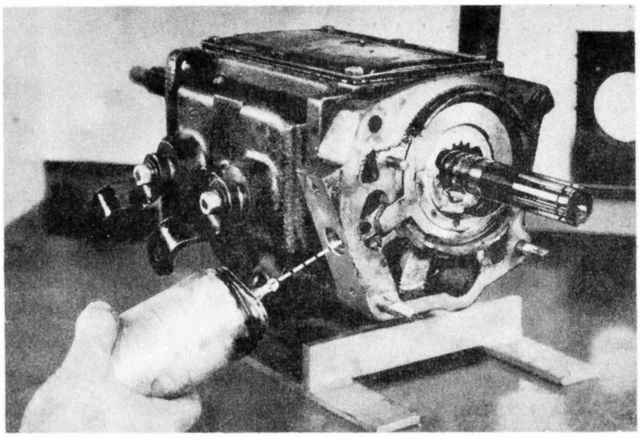


Figure 18—Install the solenoid by turning it counter-clockwise so the plunger will lock with the pawl.

INSTALLING THE SUN GEAR AND SHIFTER ROD ASSEMBLY

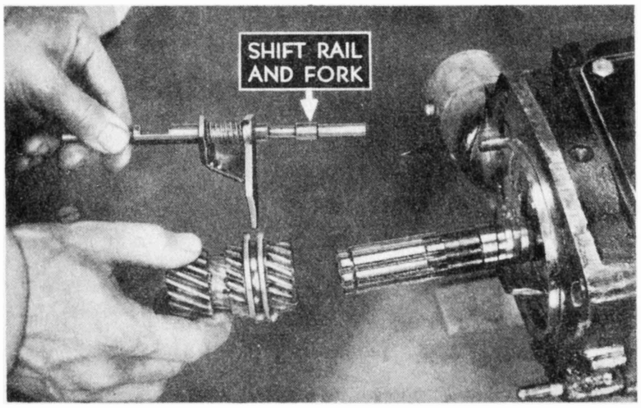


Figure 19—The shift rail and fork assembly is installed with the sun gear and collar.

Install the fork of the shift rod rail in the sun gear shift collar. Then hold them together as you slide the sun gear onto the spline shaft and the shifter rod into the hole in the bearing adapter (Fig. 19).

INSTALLING THE PINION CAGE AND CAM

Install the pinion cage assembly on the spline shaft, being careful not to distort the oil slinger. Then slide the free wheeling cam assembly onto the shaft and line up the slots in the pinion cage with the slots in the free wheeling cam. Finally, install the pinion cage retaining clip and the free wheeling cam retaining clip (Fig. 20).

NOTE: Now shift the sun gear into and out of engagement, to insure clearance between the sun gear and the oil trough.

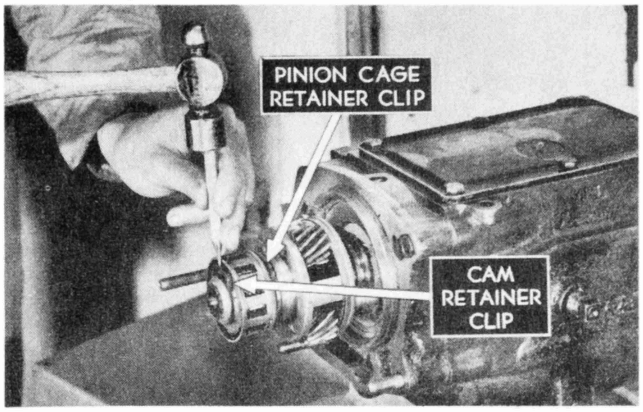


Figure 20—With the free wheeling cam and pinion cage on the spline shaft, lock them in place with the pinion cage retaining clip and the free wheeling cam retaining clip.

INSTALLING THE RING GEAR AND MAIN SHAFT

Replace the ring gear on the overdrive main shaft and lock it in place with a snap ring (Fig. 21).

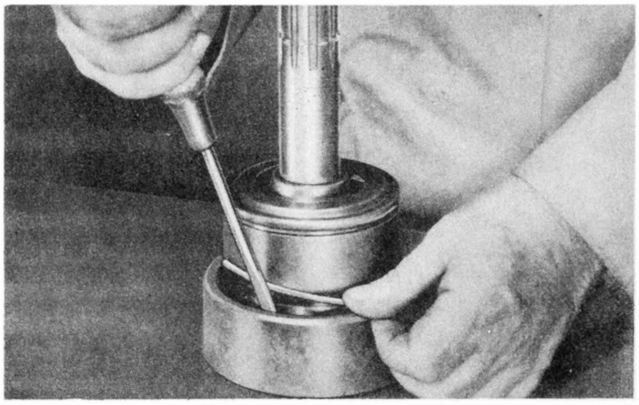


Figure 21—Install a snap ring to hold the ring gear on the main shaft.

The Free Wheeling Rollers

Before installing the main shaft and ring gear on the free wheeling cam and cage, the free wheeling rollers must be replaced on the cam.

Replace the free wheeling rollers in the free wheeling cam retainer, using heavy grease to hold them in position. A small rubber band, placed around the rollers (Fig. 22) will also help to keep the rollers from dropping out while you're installing the main shaft and ring gear.

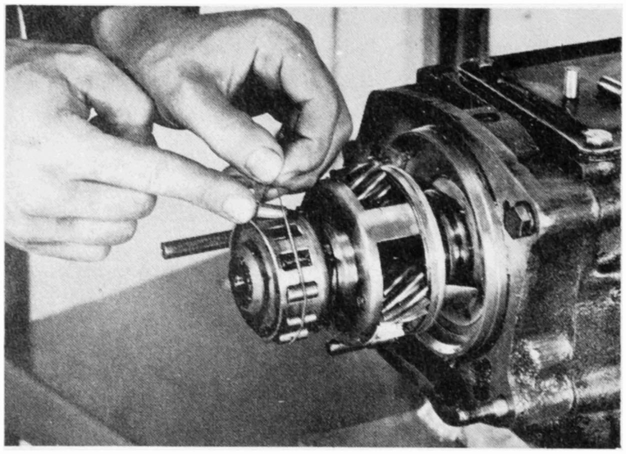


Figure 22—A rubber band serves to hold the free-wheeling rollers in position until the ring gear and main shaft can be installed.

Now, rotate the cage and roller assembly counterclockwise so the rollers will be at the bottom of the cams to permit the installation of the overdrive main shaft.

Then test the action of the free wheeling cam as outlined on page 8.

With the rollers in place, you're ready to install the ring gear and main shaft (Fig. 23). Line up the teeth in the ring gear with the teeth on the pinions.

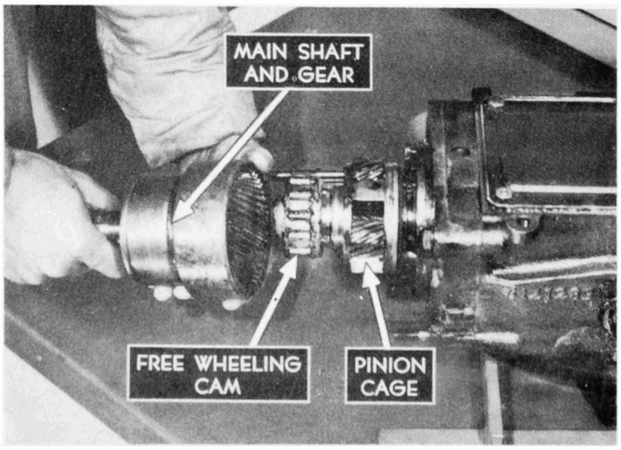


Figure 23—Install the main shaft and ring gear on the pinion cage and free wheeling cam.

INSTALLING THE MAIN SHAFT BEARINGS

First, install the rear bearing inner snap ring in the overdrive case. Press the rear bearing in from the rear of the case until it seats against this ring. Then install the rear bearing outer snap ring (Fig. 24).

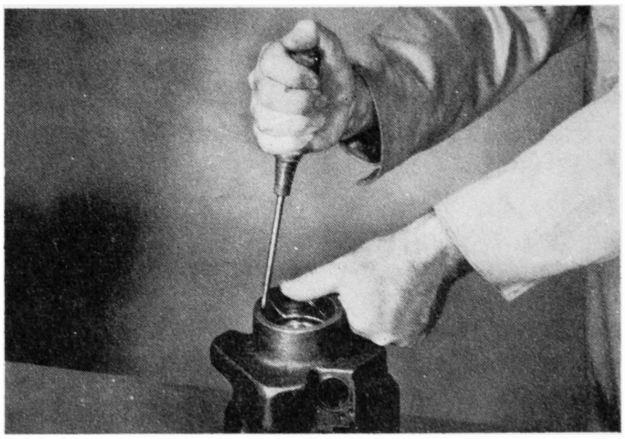


Figure 24—Install a snap ring on each side of the overdrive rear bearing.

The Speedometer and Governor Drive Gears

Install the speedometer and governor drive gears from the front of the overdrive case. The speedometer gear (the wider of the two) goes in first, against the rear bearing.

With both gears in place, install the main shaft front bearing, lining up the holes in the gears with the holes in the bearings so that the main shaft will enter freely. When the bearings and gears are lined up, tap the front bearing down against the gears to hold them in alignment until the case is installed on the shaft.

INSTALLING THE SHIFT SHAFT AND OVERDRIVE CASE

Install the shift shaft oil seal, the shift shaft, the shifting lever and the shifter rod spring in the overdrive case. Then remove the bolts holding the bearing adapter to the transmission case, and work the overdrive case onto the overdrive assembly. Using a long punch, guide the shift shaft through the spring and case. Install the stud sleeve at the lower left transmission to overdrive case stud, to assure alignment of the overdrive and transmission cases. This will insure free movement of the shifter rod. Replace the cap screws and tighten them securely.

Push the shift shaft into the case so that the operating cam will engage with the slot in the shift rail. Then drive in the lock pin to hold the shaft in position.

NOTE: Inspect the operation of the shift lever as follows. With the lever against the machined stop on the boss of the case, a slight free movement with no tension should be evident. Excessive movement with no tension indicates that the shift rod is binding in the case.

Finally, tighten the solenoid cap screws.

COMPLETING THE ASSEMBLY

Install the shift switch and governor in the overdrive case. Then install a new oil seal in the rear of the case and fit the companion flange over the main shaft. Tighten it in place with the companion flange nut and washer. If it's not tightened securely the speedometer and governor drive gears may turn on the shaft.

LUBRICATION OF THE OVERDRIVE

Check the lubricant level of the transmission and the overdrive every 2000 miles. Transmission and overdrive units should be filled to the drain plug level on the right side of both units. Drain and clean twice a year, or every 10000 miles, using only flushing oils. Do not use gasoline, kerosene, steam, etc. For atmospheric temperatures above 32° Fahrenheit use SAE oil No. 90 in the transmission and overdrive. Below 32° Fahrenheit use SAE oil No. 80 in the transmission and overdrive. Where difficulty in shifting is experienced in subzero temperatures, dilute transmission and overdrive oil as required, using light engine oil.

Do not use gear oil with extreme pressure lubricants or other compounded agents.

LUBRICATION CHART—

Nash Transmissions and Overdrives

Standard	Capacity (U.S. Measures)	Including Overdrive	Capacity (U.S. Measure
41-4240	1 pt.	41-4240	3 pts.
46-4740	2¼ pts.	———	———
41-4260-80	4 pts.	41-4260-80	6 pts.
46-4760	4 pts.	46-4760	6 pts.

THE OVERDRIVE CONTROL SYSTEM

Starting with Serial Number N6-120026, the overdrive is governor-controlled. That is, a governor controls the electrical circuit which operates the overdrive. In order to service this control system, it is very important to understand just how it works. The following paragraphs explain the entire overdrive control system.

THE ELECTRICAL CIRCUITS

The electrical system consists of the three circuits indicated in Fig. 25:

A—*Governor Circuit*—light line
B—*Solenoid Circuit*—heavy line
C—*Kickdown Circuit*—dotted line

A—Governor Circuit

Starts from a terminal on the ignition switch to the terminal "IGN" on the overdrive relay. Then passing through the relay coil which magnetically controls the contact points "B" of the solenoid circuit, it continues from the "TH" terminal of the relay to the kickdown switch relay terminal "E."

Crossing the kickdown switch to the overdrive terminal "K," thence to "F" and through the closed contacts of the overdrive shift switch to terminal "G" and to the governor "H" and its open contact points "A."

B—Solenoid Circuit

Starts at the hot terminal of the horn relay. Proceeds to the battery terminal of the relay where it passes through a 20-ampere fuse then to the open contact points "B."

Circuit is resumed at the solenoid terminal "SOL" of the relay and proceeds to terminal "4" of the solenoid where it divides into two coils passing through the holding coil to the ground and through the solenoid coil and closed contacts "C" to the ground.

C—Kickdown Circuit

Starts at the ignition coil distributor terminal. Pro-

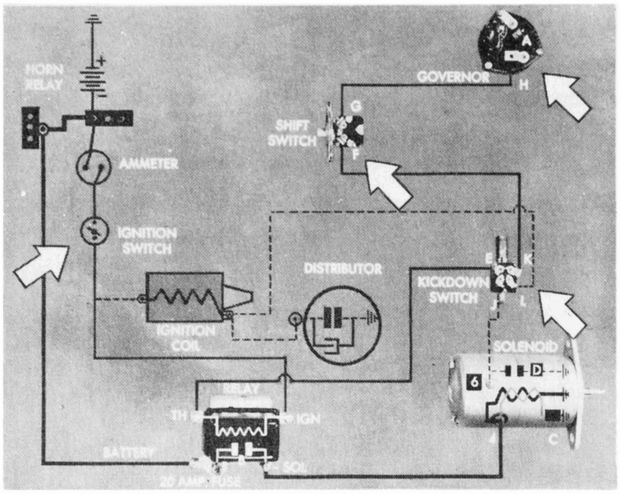

HORN RELAY
AMMETER
IGNITION SWITCH
IGNITION COIL
DISTRIBUTOR
GOVERNOR
A
H
G
SHIFT SWITCH
F
E
K
KICKDOWN SWITCH
J
L
SOLENOID
D
6
C
4
RELAY
TH
IGN
BATTERY
SOL
20 AMP. FUSE

Figure 25—The governor circuit (light line), the solenoid circuit (heavy line), and the kickdown circuit (dotted line) all operate to energize or de-energize the solenoid—thus engaging or disengaging the locking pawl, and throwing the overdrive in or out of cruising gear.

ceeds to the coil terminal "L" on the kickdown switch. From the open contacts of the kickdown switch, the circuit proceeds from terminal "J" to terminal "6" on the solenoid. Open contacts "D" are in the path between terminal "6" and the solenoid ground.

THE CIRCUITS IN ACTION

When the car attains a speed of 22 to 25 miles per hour, the centrifugal action of the weights in the governor closes its contacts "A" (Fig. 25), thus completing the circuit from the ignition switch to the ground.

The relay coil, being energized magnetically, closes the relay contacts "B" of the solenoid circuit.

The solenoid circuit, being completed, immediately energizes the actuating coil of the solenoid, moving the pawl into the balk ring and the lock plate.

As soon as the solenoid plunger has been permitted to enter the lock plate, the contacts "C" in the solenoid actuating circuit are opened, permitting a decreased flow of current through the holding coil to retain the plunger in position during the time the overdrive is in operation.

The inward movement of the solenoid plunger, in addition to operating the contact "C" in the solenoid actuating circuit, also closes contact "D" in the kickdown circuit through the release of the spring lever on the outer end of the solenoid. The circuits are now in normal condition for continuing the overdrive operation.

In order to understand the overdrive control system, the first thing to remember is that any time there's an open switch in a circuit, that entire circuit is open and inactive. When all four switches in the governor circuit are closed, the relay coil is energized, closing the points "B." This completes the solenoid circuit and energizes the solenoid which, through the locking pawl, locks the sun gear and places the overdrive in cruising gear. Also, any time any one of the four governor circuit switches is open, the relay coil is de-energized, the points open, and the solenoid circuit is broken.

At Speeds Below 22-25 Miles an Hour

With the cruising gear control forward, at speeds below 22-25 miles an hour, every switch in the governor circuit is closed *except* the governor switch (Fig. 26). But this one open switch is enough to keep the entire governor circuit *and* the solenoid circuit open . . . and the solenoid remains de-energized.

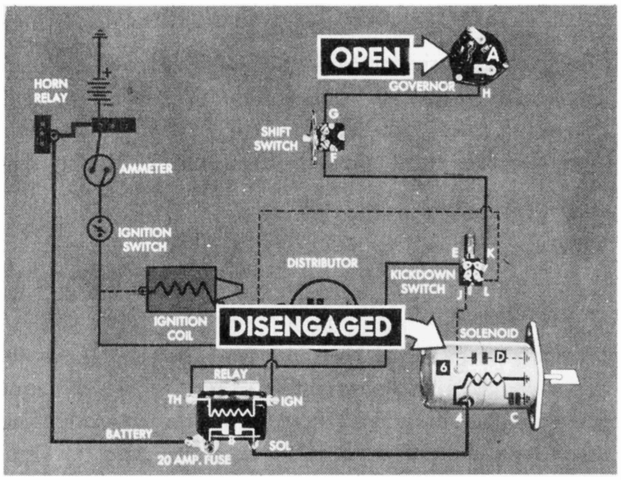

OPEN
A
GOVERNOR
H
HORN RELAY
G
SHIFT SWITCH
F
AMMETER
IGNITION SWITCH
DISTRIBUTOR
E
K
KICKDOWN SWITCH
J
L
IGNITION COIL
DISENGAGED
SOLENOID
D
6
RELAY
TH
IGN
BATTERY
4
C
20 AMP. FUSE
SOL

Figure 26—At less than 22 miles an hour the governor switch keeps the circuit open and the solenoid pawl remains disengaged.

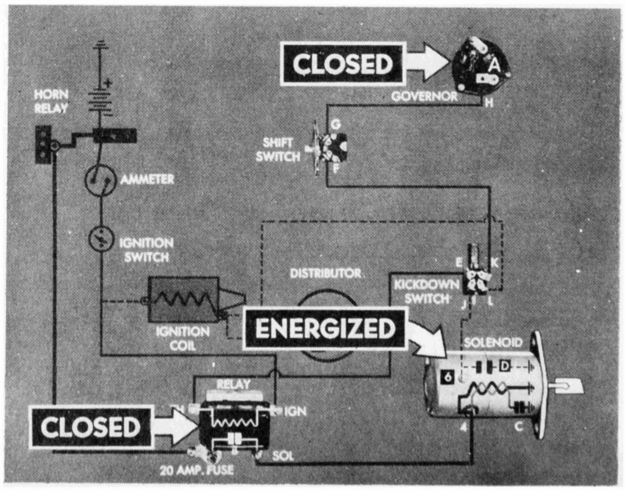

CLOSED
A
GOVERNOR
H
HORN RELAY
G
SHIFT SWITCH
F
AMMETER
IGNITION SWITCH
DISTRIBUTOR
E
K
KICKDOWN SWITCH
J
L
IGNITION COIL
ENERGIZED
SOLENOID
D
6
RELAY
CLOSED
IGN
4
C
20 AMP. FUSE
SOL

Figure 27—Above 25 miles an hour the governor points automatically close, thus closing the governor circuit and the relay, which energizes the solenoid.

At Speeds Above 22-25 Miles an Hour

As the speed of the car passes 22-25 miles an hour, the governor points automatically close. This completes the governor circuit, energizes the relay and closes the relay points "B" . . . thus energizing the solenoid.

Then, with a momentary release of the accelerator pedal, engine torque is released just long enough for the solenoid pawl to move off the step of the balk ring and engage the notch of the lock plate, locking the sun gear. This places the car in cruising gear (Fig. 27).

The Kickdown Switch (and Overtake Position)

With the car in cruising gear at speeds above 22-25 miles an hour, depressing the foot accelerator all the way to the floor places the overdrive in overtake position.

This is due to the fact that the accelerator pedal is connected to the kickdown switch. Depressing the accelerator opens the points "E" and "K" in the kickdown switch and closes the points "J" and "L" (Fig. 25). This at the same time breaks the governor circuit and completes the kickdown circuit. The break in the governor circuit de-energizes the solenoid. And the closing of the kickdown circuit momentarily "shorts out" the distributor (Fig. 28) (for approximately two crankshaft revolutions) releasing engine torque just long enough for the solenoid pawl to disengage. The instant that the solenoid disengages, the solenoid points "D" automatically open, restoring the distributor circuit. The car then remains in direct gear as long as the engine is kept under a pulling load.

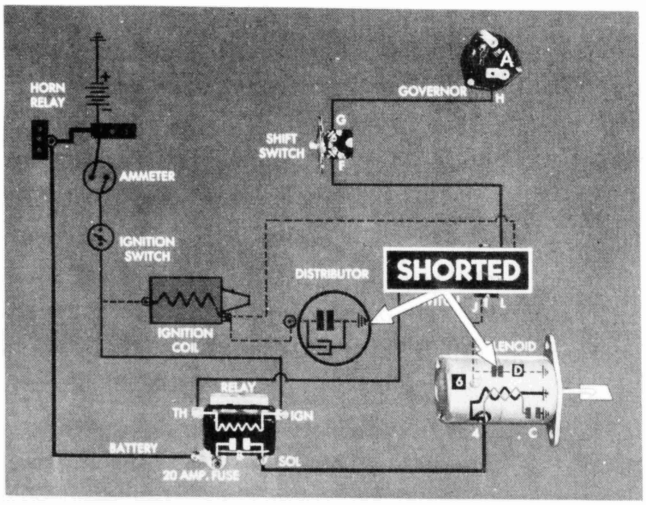


Figure 28—With the kickdown switch open, the governor circuit is broken and the solenoid de-energized. Also the distributor is shorted out to release engine torque.

The Overdrive Shift Switch

The cruising gear control button on the instrument panel is connected to the shift lever and rod that operates the shift switch. When this button is all the way forward, the shift switch is closed and the overdrive will operate as detailed in the foregoing paragraphs. Pulling this button to the rear or conventional position (Fig. 29), however, moves the shift rod in the overdrive so as to open the shift switch (breaking the governor circuit). This also shifts the sun gear into the locked-out position. The overdrive in this position is in direct gear at all times.

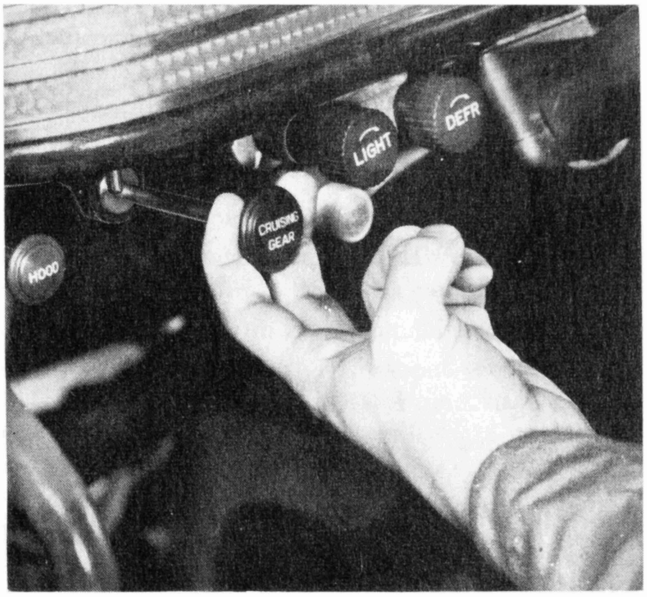


Figure 29—Pulling the cruising gear control all the way out opens the shift switch and, at the same time, meshes the sun gear with the pinion cage, thus locking the overdrive in direct gear.

Placing the gear shift lever in the reverse position does the same thing as pulling out the cruising gear control button. When the transmission is placed in reverse, the cam on the shifter shaft quadrant moves the shifter rod to the rear, shifting the sun gear collar, locking the overdrive in direct gear, and opening the shift switch.

DIAGNOSING OVERDRIVE TROUBLES

Since overdrive troubles may originate, not only in the mechanical operation of the unit but also in the electrical circuit which controls that unit, the service man should always check the control system before disassembling the overdrive.

If the trouble is not found after a thorough inspection of the control system, then the transmission and overdrive should be removed for examination.

UNSATISFACTORY OVERDRIVE OPERATION

Look for . . .

1. Loose terminals on any of the connecting wires.
2. Connecting wires on wrong terminals. (Check wiring diagram, Fig. 25.)
3. Circuits grounded by water, dirt, corrosion, or deformation.
4. Burned or corroded relay fuse in solenoid circuit. (Check solenoid points—replace solenoid if necessary.)
5. Dirty or sticking relay contact points.
6. Insufficient travel or unsatisfactory contacts in the kickdown switch.
7. Dirty or sticking points in the shift switch.
8. Governor inoperative. (Check for loose drive gear on main shaft.)
9. Excessive end play in governor shaft. (Replace governor.)
10. Badly adjusted governor control springs. (Replace governor.)
11. Burnt governor contact points. (Replace governor.)
12. Damaged governor cap and contacts. (Replace governor.)
13. Rubber governor cover missing.
14. Shift switch held open by shift rail stuck in overdrive. (This is caused by misalignment of overdrive and transmission case. Install a new stud sleeve No. 3124053 at the lower left transmission to overdrive case stud.)

MECHANICAL CHECKS

1. Determine if the overdrive control button is pushed in to the limit of its travel.
2. Inspect the overdrive lock-out cable to see that it is adjusted so that it will move the overdrive lever firmly against the stop on the overdrive housing in the engaged position.
3. Inspect for any erratic action of the speedometer hand or irregular governor cut-in speeds. This may be due to looseness in the speedometer and governor drive gears. (To correct, tighten the universal joint companion flange screw.)

ELECTRICAL CHECKS

For these inspections, use a test wire or a 6-volt test light. All directions are given as viewed from the driver's seat.

1. Inspect the 20-ampere fuse in the overdrive relay. Inspect the relay points and clean them.
2. With the test wire, make a connection from the center terminal on the horn relay to the lower left hand terminal (marked "SOL") on the overdrive relay. This will supply current to the solenoid, which should operate. If it doesn't, the solenoid is at fault and should be replaced.
3. With the test wire, ground the upper right rear terminal (marked "TH") of the relay. If the relay is functioning, you'll hear the relay points close and the solenoid will operate.
4. With the test wire, ground the upper right terminal of the kickdown switch ("E" in Fig. 25). If the circuits are correct up to this point, the solenoid will operate.
5. With the kickdown switch grounded at terminal "E", pull down on the kickdown switch cable. This will break the circuit, and the solenoid should release.

If the solenoid operates in making the above tests, all circuits up to this point are correct. Further tests must be made under the car.

6. With the test wire, ground terminal "F" (Fig. 25) on the overdrive shift switch. The solenoid should operate as the connection is made. Then ground terminal "G" on the overdrive shift switch, and again the solenoid should operate. If it doesn't the switch is at fault.

Then, inspect the shift rod—it may be stuck in the case. This will be indicated by a lack of spring tension on the lever. Inspect the control cable for proper adjustment.

7. With the test wire, ground terminal "F" (Fig. 25) on the governor. The solenoid should operate.
8. *Governor operation inspection.*
   Jack up the rear axle so that both wheels are free. Operate the engine in high gear at the governor cut-in speeds.
   Apply a test light across the governor terminal "H" to the ground terminal "M" (Fig. 25). The cut-in speed will be indicated when the test light illuminates.
   If the cut-in speed is outside the normal range, replace the governor. No adjustments are recommended.

SUMMARY

In order to determine the trouble correctly, the above tests must be made in the order given.

Careful inspection should be made of the kick-down switch to be sure the terminals do not touch each other. If either of the terminals "F" and "G" is grounded, the solenoid will operate, but without permitting the pawl to disengage. This is usually the condition that exists when the car will not free wheel or shift into reverse properly.

Inspect the governor to be sure that no water, dirt, or foreign material has grounded it. A rubber boot has been provided and should be installed on governors that were not originally equipped with them.

THE FORTY-ONE, FORTY-TWO AND FORTY-SIX SERIES

(41-4240-60-80, 4660)

◆

SERVICING THE OVERDRIVE

The procedure for servicing the Forty-One and Forty-Two Series is essentially the same as the one detailed in the foregoing pages. In servicing these earlier series it is important to give careful study and make constant reference to the procedure for the Forty-Six and Forty-Seven series. The following pages give details only on those points where these units are different from those already covered.

THE OVERDRIVE CASE

41-4260-80 Series

On these series the hub section of the speedometer gear is toward the rear. The rear bearing and speedometer gear are held in the case by the companion flange and nut. Therefore, during assembly it is important to draw the companion flange retaining screw up tight, to keep the speedometer gear from turning on the shaft.

41-4240 Series

On these series the hub section of the speedometer gear is toward the front. The rear bearing and speedometer gear are held in place by a snap ring. And the speedometer gear is keyed to the main shaft to keep it from slipping.

All 41-42 Series

The overdrive case is removed just as detailed on page 4, Fig. 2. On these series, however, the shift collar will remain in the case as the case is removed (Fig. 30). To remove this collar, first remove the cotter pin and draw the reverse lockout pin through the front of the case. You can then turn the shift fork enough to free the shift collar.

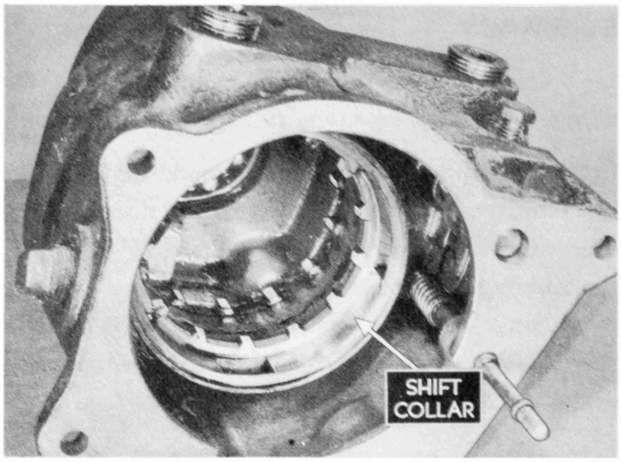


Figure 30—On the 41-42 Series, the shift collar is removed from the case after the case is removed from the overdrive.

The overdrive shifter fork shaft is removed through the front of the case by first taking out the limiting screw and the shift fork shaft retaining screw (through a hole in the top of the case). In these models, shift collar travel is determined by this limiting screw.

THE CAM AND ROLLER ASSEMBLY

All 41-42 Series

The free wheeling cam and roller assembly is held on the transmission main shaft by a cap screw and washer. The cap screw is threaded into the end of the transmission shaft. When these are removed, you can take out the overdrive tail shaft pilot bushing and lock plate (Fig. 31).

On assembly it is important to line up the tongue of this lock plate with one of the splines in the shaft. And be sure to use a new lock washer under the cap screw.

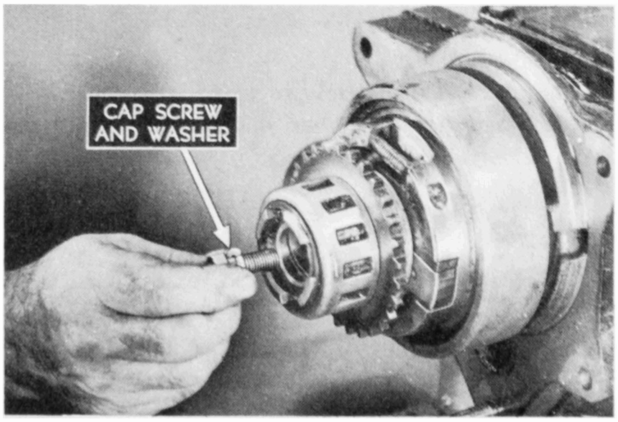


Figure 31—On the 41-42 Series the cam and roller assembly is held on the transmission spline shaft by a cap screw and lock washer.

THE OVERDRIVE RING GEAR AND CLUTCH ASSEMBLY

After the cam and roller assembly has been removed, the ring gear and clutch assembly can be taken off the shaft.

> *NOTE: The overdrive clutch assembly is serviced and replaced as a complete unit.*

PAWL ADJUSTMENT

All 41-42 Series

Each pawl is adjusted so that, at the correct speed, centrifugal force will overcome the spring tension, and the pawls will engage the shifting collar. The adjusting screw controls this spring tension, and under each screw is a slotted tension washer that locks the screw in position (Fig. 32).

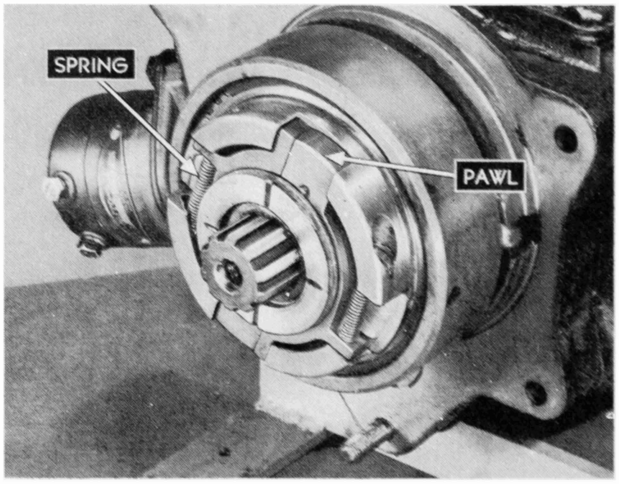


Figure 32—The spring tension governs the speed at which the pawl engages the shifting collar.

THE PINION CAGE AND GEARS

The planetary pinion gears used on this series is of the split type—one narrow and one wide—which are held under tension by a spring. On each of the pinions, one tooth is marked. It is important in assembling this series that the marked teeth in each set be lined up with each other. Here's how to line them up.

First, either shift the transmission into two gears at once or hold the gears so that the transmission shaft cannot turn. Install the pinion cage on the sun gear just far enough so that only the *larger* gear in each set of pinions engages the teeth of the sun gear. Hold the gears in this position with a screwdriver (Fig. 33). Now slip the ring gear and clutch assembly over the pinions, but only far enough to engage the *smaller* gear in each set of pinions. Then rotate the ring gear clockwise until the marked teeth line up, and slide the ring gear all the way onto the pinions.

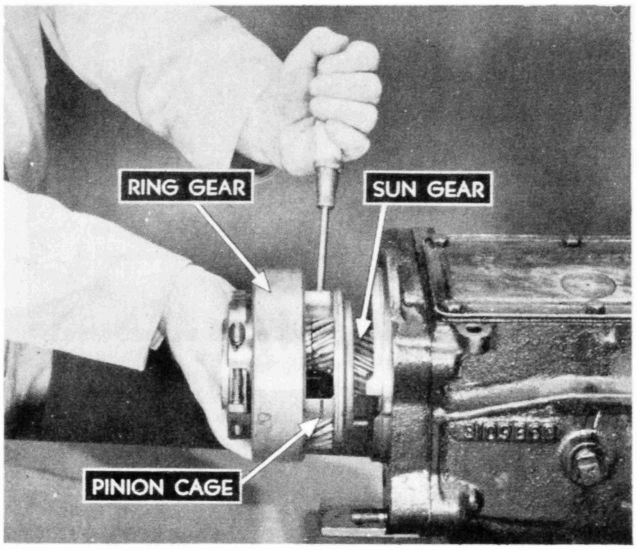


Figure 33—Lining up the marked teeth in each set of pinions. The larger pinions go toward the front.

THE SUN GEAR AND HUB

All 41-42 Series

The sun gear and hub are removed from the overdrive as an assembly. To separate them it is necessary to remove the snap ring. Use the snap ring pliers (KMO 410) as shown in Fig. 34.

When reassembling the sun gear and hub, be sure the oil notches in the sun gear line up with the notches in the sun gear hub.

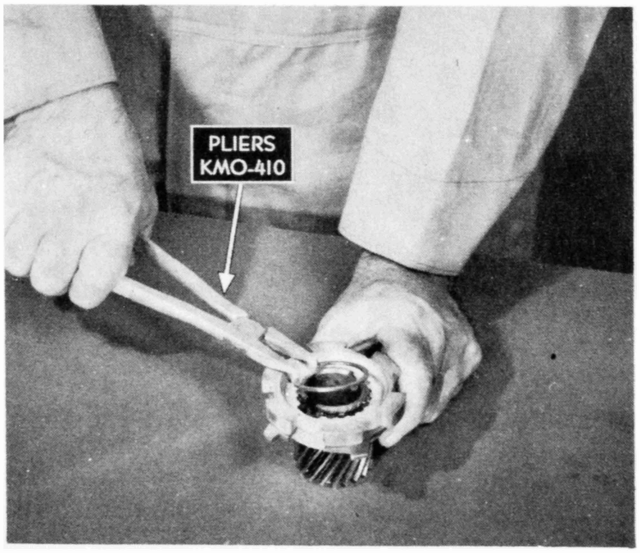


Figure 34—Special snap ring pliers are used to remove the snap ring that holds the sun gear and hub together.

THE REVERSE LOCK-OUT PIN

All 41-42 Series

The purpose of this pin is to lock out the overdrive whenever the transmission is shifted into reverse. The pin is against the low and reverse shift quadrant in the transmission and the shift collar in the overdrive. Thus, any time the transmission is put in reverse, the shift collar is pushed to the rear, engaging the teeth on the free wheel clutch cam. This engages the overdrive in direct gear.

Sometimes, the teeth will "dead-end", or abutt, when the transmission is shifted to reverse. To eliminate this, a compression spring is placed between the rear end of the lock-out pin and the overdrive shift fork (Fig. 35). When the teeth abutt on reverse, the spring puts pressure on the shift fork. Then as the gears begin to rotate and the teeth line up, this spring pressure completes the engagement.

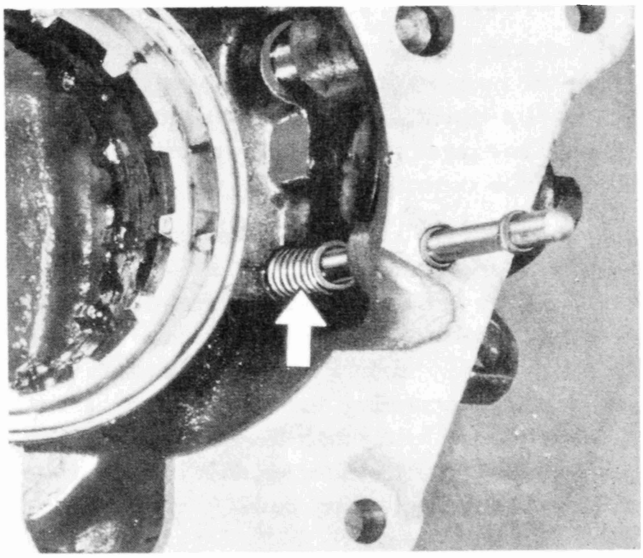


Figure 35—To avoid "dead-ending," or abutting, of gear teeth when the transmission is shifted to reverse, a compression spring insures engagement of the teeth.

THE OVERDRIVE CONTROL CABLE

All 41-42 Series

The overdrive control cable must be properly adjusted to insure the correct travel of the overdrive shift collar. To adjust it, loosen the cable clamp at the overdrive shift lever. Move the lever into *full* overdrive position (with the bottom of the lever toward the rear of the car). Push the cruising gear control button all the way in—then pull it out ⅛ of an inch. Tighten the cable clamp securely.

SHIFT LEVER SPRING ADJUSTMENT

All 41-42 Series

To insure positive "in" or "out" position of the overdrive shift lever, an over-center spring is used between the lever and a spring bracket. When installing this spring, place the long end of the spring in the lever hole, and secure the lever. Place the other end of the spring in the hole in the bracket. Install the bracket, using a plain washer, a lock washer, and a screw. To test the spring, move the lever into the forward position. There should be a slight spring tension on the lever. If the spring tension is incorrect, it may be adjusted by tilting the bracket slightly.

KICKDOWN, SOLENOID AND RELAY ADJUSTMENT

All 41-42 Series and 4660 Series up to N6-120026

The electrical control units for these models are only for the purpose of restoring conventional gear operation for quick acceleration. Normal engagement or disengagement of the overdrive is controlled by the centrifugal clutch.

The electrical circuit for this series (Fig. 36) consists of the kickdown switch, the relay and the solenoid. Fully depressing the accelerator pedal closes the kickdown switch. This closes the relay points, thereby completing the circuit to the solenoid and interrupting the ignition circuit for approximately two crankshaft revolutions. This releases engine torque just long enough for the solenoid to pull out the locking pawl . . . leaving the overdrive in direct gear.

TYPES OF OVERDRIVE ELECTRICAL CONTROLS

The Delco-Remy relay and solenoid are used on the 41-4240 Series and on the 4660 Series up to Serial Number N6-95333. The Delco-Remy solenoid can be identified by its having only the one connecting terminal (Fig. 36).

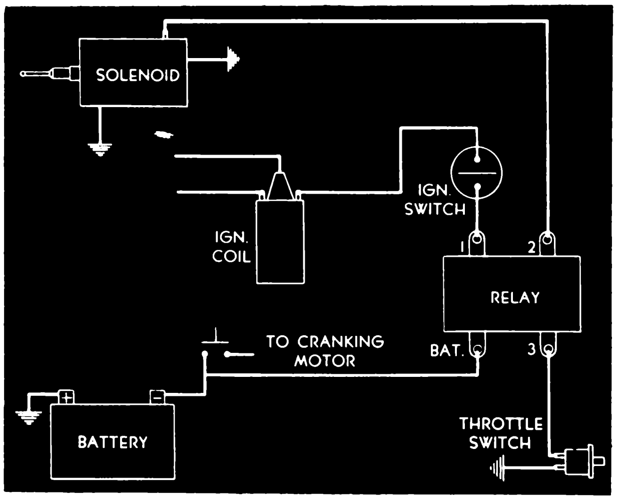


Figure 36—The kickdown circuit is operated by Delco-Remy relay and solenoid on the 41-42 Series and the 4660 Series up to N6-95333.

From Serial Number N6-95333 to Serial Number N6-120026 Equipped with Overdrive

On cars of the 4660 Series, from Service Serial Numbers N6-95333 to N6-120026, which are equipped with overdrive, the Auto-Lite relay and solenoid are used in the electrical control system. The Auto-Lite solenoid can be identified by the two connecting wire terminals (Fig. 37).

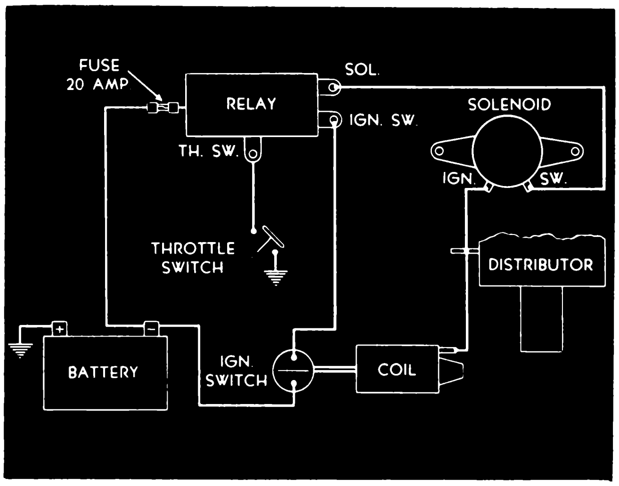


Figure 37—On the 4660 Series, from N6-95333 to N6-120026, the Auto-Lite relay and solenoid are used.

BODY SECTION

Nash

TECHNICAL SERVICE MANUAL

INDEX

Subject No.	Subject	Page
1.	Body Identification	3
2.	Ordering Body Parts	3
3.	Bodies—Complete or Skeleton	4
4.	Complete Assemblies, sub-Assemblies and Individual Parts	5
5.	Doors and Deck Covers	8
6.	Front Door Inside and Outside Trim Parts	8
7.	Parts Assembled—Right Front Door	9
8.	Parts Removed—Right Front Door	10
9.	Rear Door Inside and Outside Trim Parts	11
10.	Parts Assembled—Right Rear Door	11
11.	Parts Removed—Right Rear Door	12
12.	Outside Door Handle	13
13.	Key Lock—Front Doors	13
14.	Door Finish Moldings	14
15.	Remote Control and Window Regulator Handles	15
16.	Ventilator Handle—Front Door	16
17.	Front Door Arm Rest	17
18.	Door Trim Panel	17
19.	Car Keys and Lock Operation	18
20.	Remote Control—Front Doors	18
21.	Remote Control—Rear Door	19
22.	Door Lock—Front Door	20
23.	Rear Door Locks	22
24.	Front Door Ventilator Assembly	23
25.	Ventilator Center Glass Channel—Front Doors	25
26.	Window Regulator—Front Door Sedan	26
27.	Window Regulator and Glass—Brougham Doors	27
28.	Rear Door Window Regulator	28
29.	Glass side and Header Channel—Front Door	30
30.	Glass Side and Header Channel—Rear Doors	30
31.	Door Glass—Front Door	31
32.	Door Glass—Rear Door	32
33.	Rear Quarter Ventilator Assembly	32
34.	Door Checks and Stops	33
35.	Door Hinge Spring Installation—Rear Door	34
36.	Door Hinge Spring Installation—Front Doors—Sedans	36
38.	Door Alignment—All Models	36
39.	Door Hinges	36
40.	Combination Lock Striker and Male Dovetail	38
41.	Bending Doors	39
42.	Door Sealer Rubbers	41

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September 1, 1948

INDEX—Continued

Subject No. Subject Page
43. Door Sill Mat ... 42
44. Body Moldings, Fastening Clips and Bolts 42
45. Instrument Panel Overlays ... 45
46. Instrument Panel Top Overlay 46
47. Left Side Instrument Panel Overlay 46
48. Instrument Panel Center Overlay (Radio) 47
49. Instrument Panel End Overlays 47
50. Glove Box ... 47
51. Glove Box Lock ... 48
52. Glove Box Door—Clock Opening Cover 49
53. Glove Box Door Overlay ... 49
54. Glove Box Door ... 49
55. Finish Molding Overlay—Front and Rear Doors. 50
56. Windshield Stainless Steel Reveal Molding 51
57. Rear Window Stainless Steel Reveal Molding 51
58. Windshield Glass in Cars Equipped with Stainless Steel Reveal Moldings ... 52
59. Rear Window Glass in Cars Equipped with Stainless Steel Reveal Molding ... 55
60. Correction of Water Leakage at Windshield or Rear Window on Cars Equipped with Stainless Steel Reveal Moldings ... 56
61. Rear Deck Cover Key Lock Handle ... 56
62. Rear Deck Cover Lock ... 59
63. Rear Deck Cover Lock Striker 60
64. Rear Deck Cover Ornament ... 60
65. Rear Deck Cover Hinges ... 61
66. Rear Deck Cover 62

Subject No. Subject Page
67. Rear Deck Cover Sealer Rubber 63
69. Cowl Ventilator 63
70. Windshield Wiper ... 64
71. Dome Light ... 67
72. Front Seat Frame—4 Door Sedans ... 68
73. Front Seat Frame—All Broughams and Some Sedans ... 68
74. Front Seat Adjuster—All Models ... 68
75. Front Seat Back Upholstery Springs, Kick Pad and Trim Parts 70
76. Rear Seat Back 73
77. Seat Cushions ... 74
78. Replacing Damaged Upholstery by Sections... 75
79. Rear Quarter Side Arm Rest and Trim Panel... 75
80. Headlining 76
82. Cleaning Upholstery 77
83. Cleaning Leather ... 78
84. Cleaning Rug Material 79
85. Glass—Care and Handling 79
86. Chromium Plated Parts ... 79
87. Stainless Steel Parts ... 79
88. Paint—Care of Finish 79
89. Body Lubrication ... 81
90. Frame—Body Dimensions Chart 1949 "600" Series ... 82
91. Frame—Body Dimensions Chart 1949 "Ambassador 6" Series ... 83

INTRODUCTION

The information and instructions in this section outline detailed procedures in maintenance operations and adjustments of the 1949 "600" Series and the 1949 "Ambassador 6" Series Bodies.

REFERENCE

The part name or assembly involved in any maintenance or adjustment operation is numbered in the Table of Contents and also in the descriptive matter and illustrations throughout the Section.

An alphabetical index is provided at the end of this Section for handy reference, to obtain the subject number assigned.

The servicing of some parts or assemblies may involve several operations which are numbered in the sequence in which they are to be performed.

For example, if you are going to remove a remote control, refer to: Subject No. 20, REMOTE CONTROL — FRONT DOOR.

REMOVAL PROCEDURE

1. Remove finish molding. See subject 14.
2. Remove remote control and window regulator handles. See subject 15.
3. Remove ventilator handle. See subject 16.

Therefore, in performing the operation of removing the Remote Control, if detailed information should be required to remove the finish molding and the handles, reference can be made to the alphabetical index. This index readily locates the procedures of these operations, which are performed in connection with the removal of the remote control, as given in detail under Subjects No. 14 and No. 15 respectively.

BODY SECTION

NASH TECHNICAL SERVICE MANUAL

1. BODY IDENTIFICATION

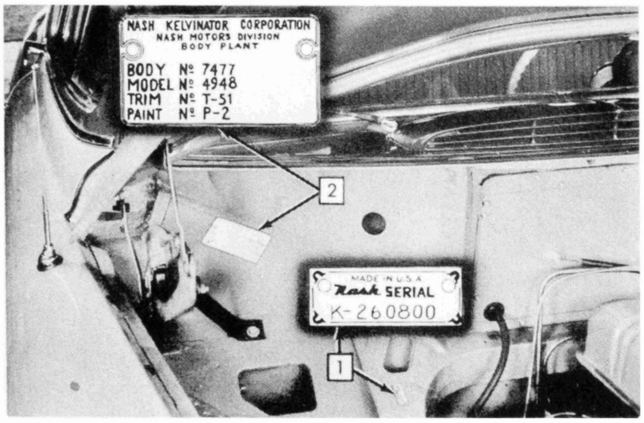
1949 "600" and "Ambassador 6" Series

Nash bodies of both series are identified by the car serial and body number plates, located on the dash at the right side under the hood. (Figs. 1, 1-A and 1-B.)

As illustrated below, the serial numbers are prefixed with the letters "K" and "R" as identifying symbols for the "600" Series and the "Ambassador 6" Series respectively.

The numbers on these plates must be given when any reference is made to the body, such as in ordering parts or material for the body.

Whenever reference is made to various parts of the body, both the name of the part and its location are very essential. For example, a door, seat cushion, seat back or fender should be referred to as right or left, front or rear.


NASH KELVINATOR CORPORATION
NASH MOTORS DIVISION
BODY PLANT
BODY Nº 7477
MODEL Nº 4948
TRIM Nº T-51
PAINT Nº P-2
2
MADE IN U.S.A.
Nash SERIAL
K-260800
1

1. Serial number plate
2. Body number plate

Figure 1—Car Identification Number Plates.

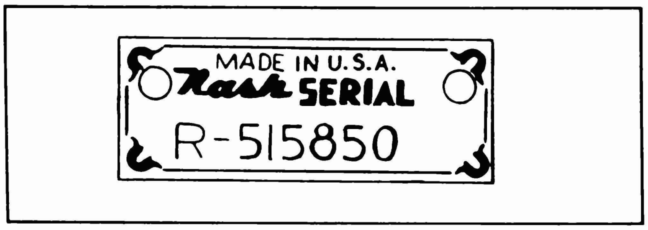

MADE IN U.S.A.
Nash SERIAL
R-515850

Figure 1-A—Serial Number Plate, "Ambassador 6" Series.

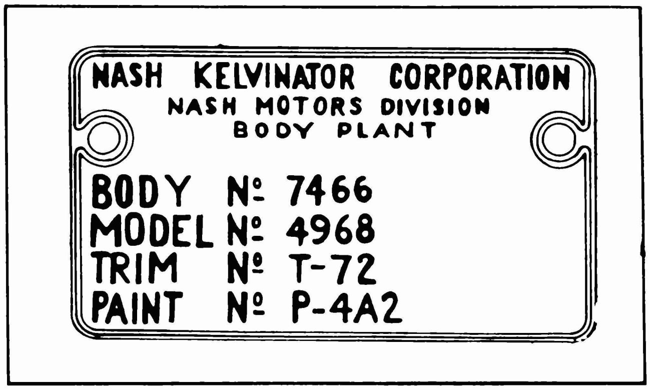

NASH KELVINATOR CORPORATION
NASH MOTORS DIVISION
BODY PLANT
BODY Nº 7466
MODEL Nº 4968
TRIM Nº T-72
PAINT Nº P-4A2

Figure 1-B—Body Number Plate, "Ambassador 6" Series.

2. ORDERING BODY PARTS

1949 "600" and "Ambassador 6" Series

Parts are ordered by part number. Therefore, with the above information, the parts desired may easily be located in the parts list, and the part number and price obtained.

Where parts are specially ordered for a certain body the serial, model and body numbers must accompany all parts orders.

Ordering Trim Material

When ordering trimmed parts or trim material, the serial, model, body, and trim numbers are required. A sample of the upholstery is helpful in insuring the correct match.

Ordering Paint

When ordering paint from local DuPont or Ditzler paint dealers, furnish them the paint code numbers as shown on the body number plate. It is also important that the name and color of paint required be given. This information is requested due to the fact that some cars are painted two-tone, and unless the color name is given it would not be known which color is desired.

For example:
Paint No. P-2

This would indicate the complete car was painted in one color.

Paint No. P4A2

This would indicate the lower color was No. 4 and the upper color was No. 2.

3. BODIES—COMPLETE OR SKELETON

1949 "600" and "Ambassador 6" Series

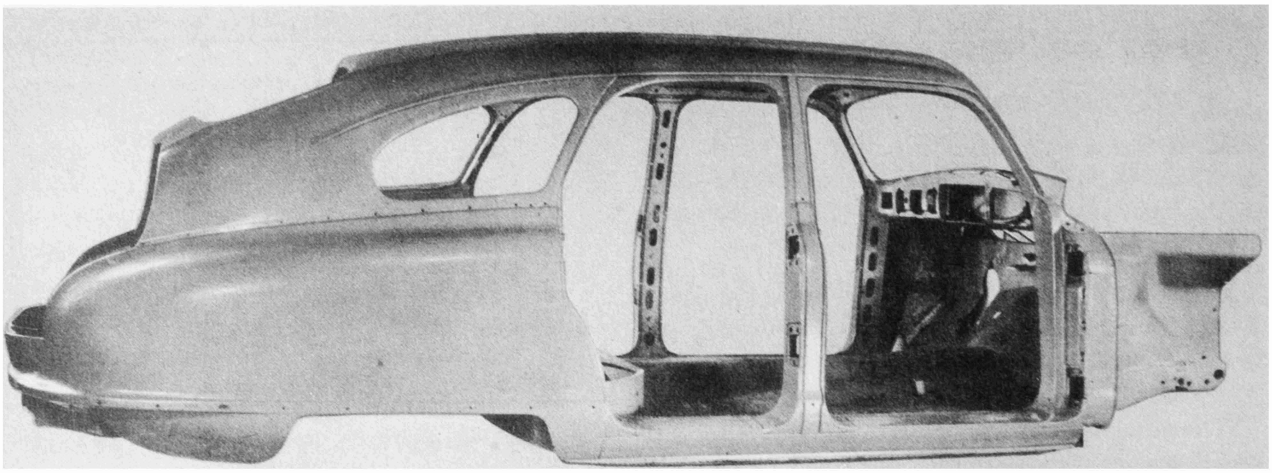
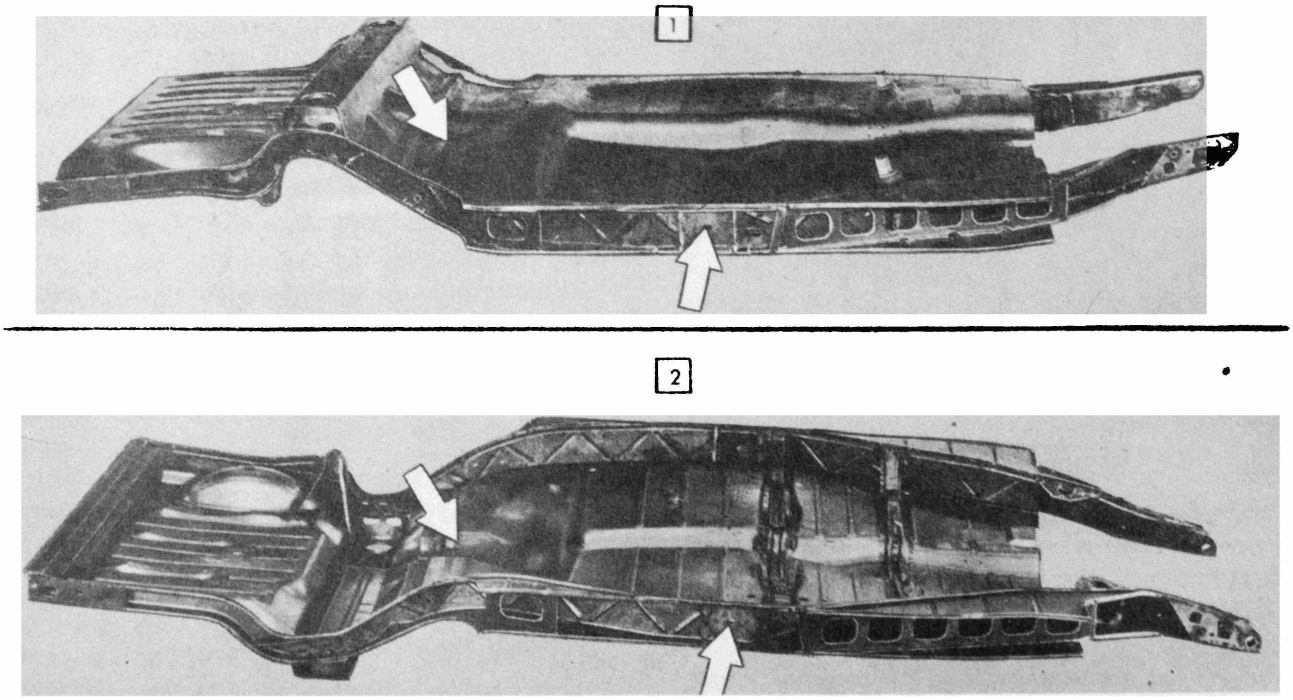


Figure 3—Skeleton Body, "Ambassador 6" Series.



1. Top view
2. Bottom view

Figure 4—Top and Bottom Views of "600" Series Floor and Frame Unit Showing Weld Joints of Individual Assemblies.

Complete Bodies

The Nash 1949 all-steel bodies are available as a complete unit in all models, painted, with upholstery and hardware, without instruments and chassis parts.

Skeleton Bodies

These are also available in all models, as shown in Figure 3, as replacements, when the car body is damaged beyond repair, while the doors, trim material, hardware and other parts may be repaired and reused. When this is the case, it is less expensive to use a "skeleton body" to which the undamaged or repaired parts are transferred.

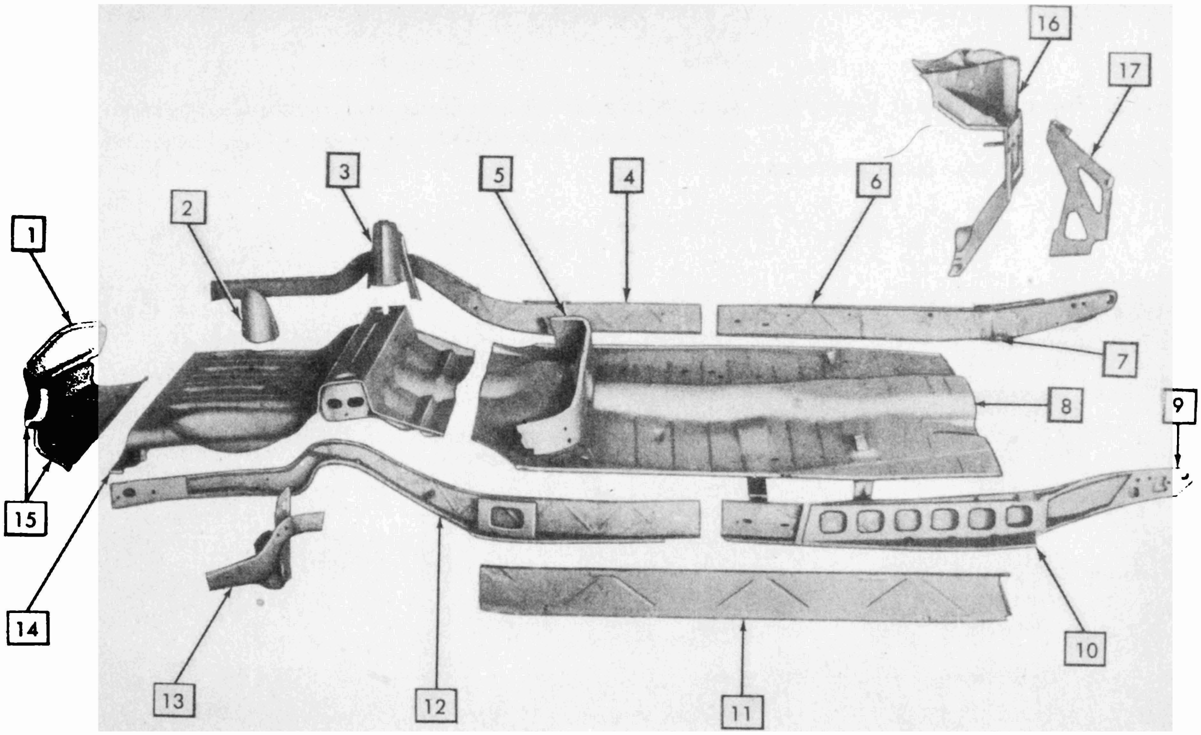
NOTE: *Bodies, complete or skeleton, are normally available only during the production year for the model desired.*

4. COMPLETE ASSEMBLIES, SUB-ASSEMBLIES AND INDIVIDUAL PARTS

1949 "600" and "Ambassador 6" Series

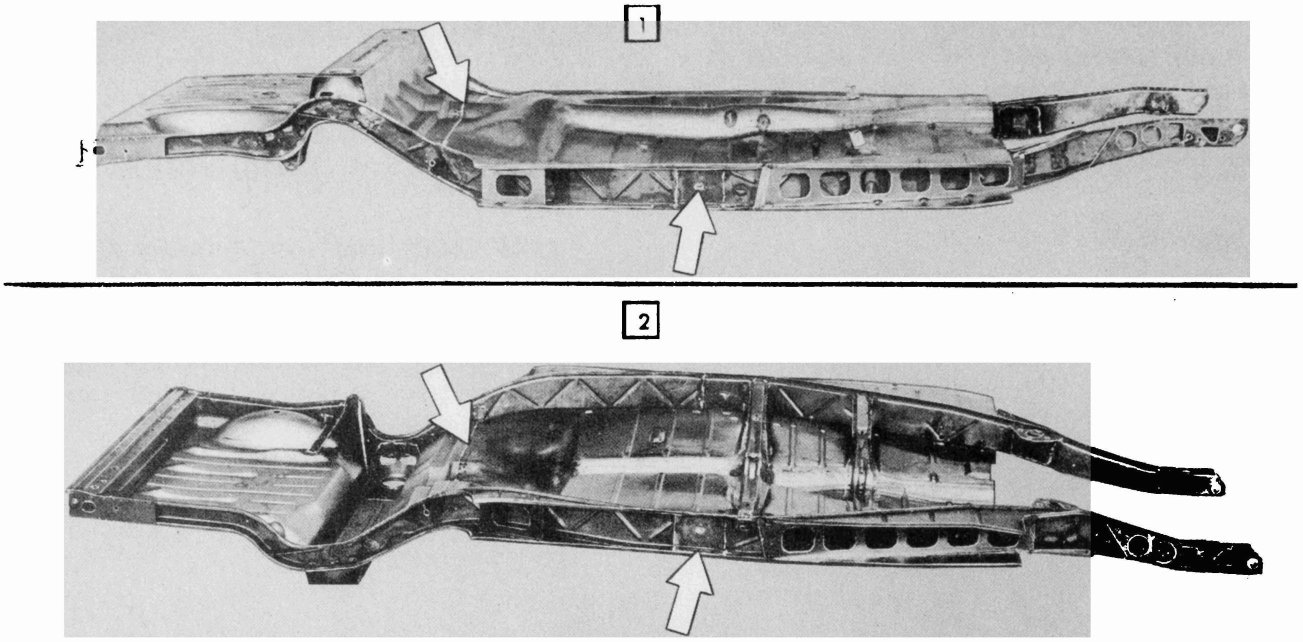
Individual assemblies or the various parts of each assembly may be welded in, as shown in Figures 4, 4-A, 4-B, 4-C, 4-D and 4-E. Many times, replacing damaged panels with new parts is less expensive than repairing the damaged section.

Underbody Floor, Frame Unit Sub-Assemblies and Individual Parts



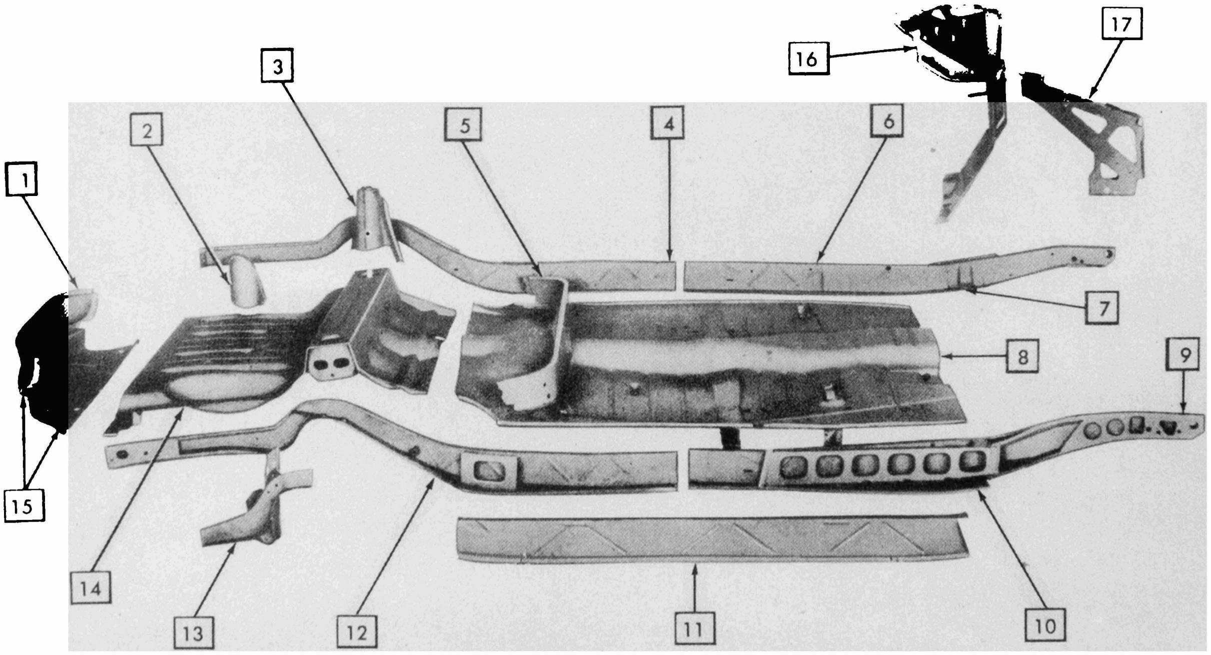
1. Rear deck lower center panel (only)
2. Gas tank filler neck cover
3. Shock absorber housing
4. Floor side sill rear—left
5. Rear seat cushion riser
6. Floor side sill front—left
7. Motor support bracket
8. Front floor pan assembly
9. Side sill reinforcement front—right
10. Floor side sill front—right
11. Body side sill panel—right
12. Floor side sill rear—right
13. Stabilizer bar bracket with sill reinforcement
14. Rear floor pan assembly
15. Rear deck lower center panel and tool pan assembly
16. Dash assembly
17. Dash to sill brace assembly

Figure 4-A—Individual Parts of "600" Series Underbody Floor and Frame Unit.



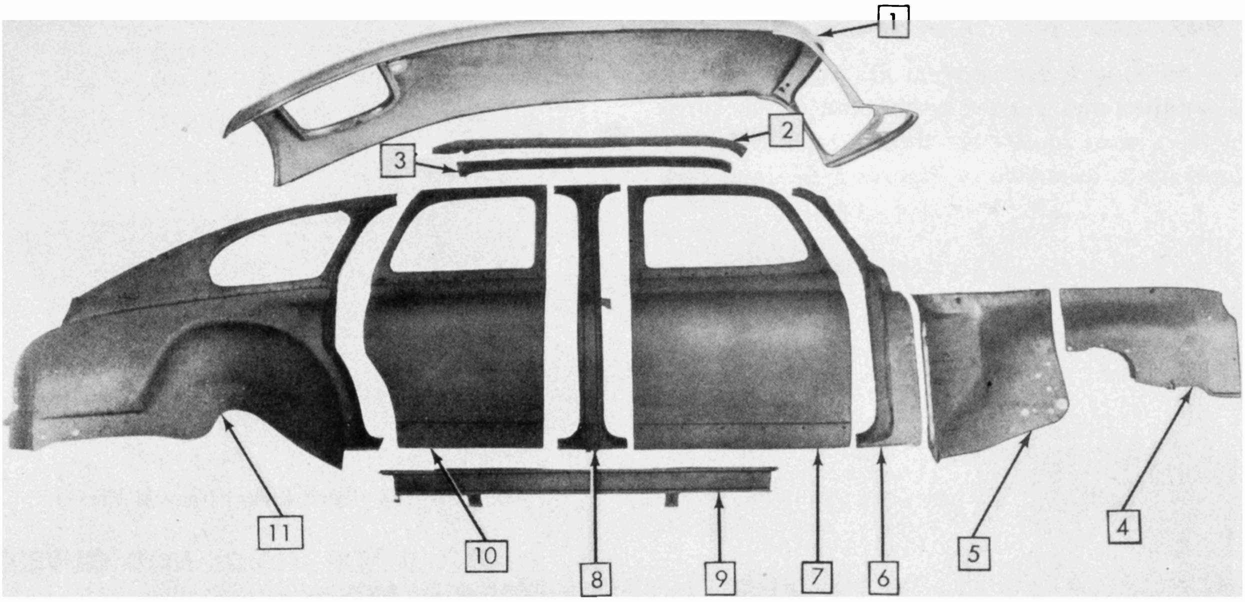
1. Top view 2. Bottom view

Figure 4-B—Top and Bottom Views of "Ambassador 6" Series Floor and Frame Unit Showing Weld Joints of Individual Assemblies.



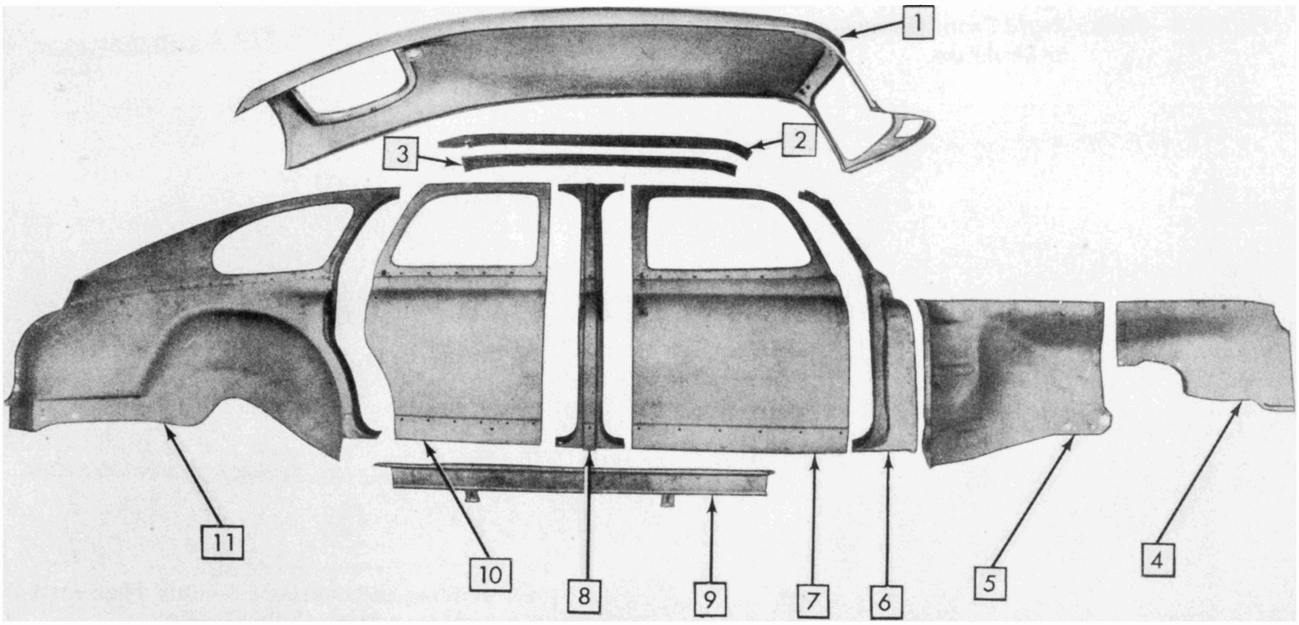
1. Rear deck lower center panel (only)
2. Gas tank filler neck cover
3. Shock absorber housing
4. Floor side sill rear—left
5. Rear seat cushion riser
6. Floor side sill front—left
7. Motor support bracket
8. Front floor pan assembly
9. Side sill reinforcement front—right
10. Floor side sill front—right
11. Body side sill panel—right
12. Floor side sill rear—right
13. Stabilizer bar bracket with sill reinforcement
14. Rear floor pan assembly
15. Rear deck lower center panel and tool pan assembly
16. Dash assembly
17. Dash to sill brace assembly

Figure 4-C—Individual Parts of "Ambassador 6" Series Underbody Floor Frame Unit.



1. Roof panel assembly
2. Side roof rail panel inner—right
3. Side roof rail panel outer—right
4. Front wheelhouse panel front—right
5. Front wheelhouse panel rear—right
6. Front body pillar assembly
7. Front door—right
8. Center body pillar assembly—right
9. Running board apron—right
10. Rear door
11. Rear quarter side panel assembly—right

Figure 4-D—Body Panels Assemblies, "600" Series. Four-Door Models.



1. Roof panel assembly
2. Side roof rail panel inner—right
3. Side roof rail panel outer—right
4. Front wheelhouse panel front—right
5. Front wheelhouse panel rear—right
6. Front body pillar assembly
7. Front door—right
8. Center body pillar assembly—right
9. Running board apron—right
10. Rear door
11. Rear quarter side panel assembly—right

Figure 4-E—Body Panels Assemblies, "Ambassador 6" Series. Four-Door Models.

5. DOORS AND DECK COVERS

1949 "600" and "Ambassador 6" Series

Service doors and deck covers are shipped ready to be installed and aligned to the body. The hardware, trim, etc., must be transferred from the damaged parts, as shown in Figures 5, 5-A and 5-B.

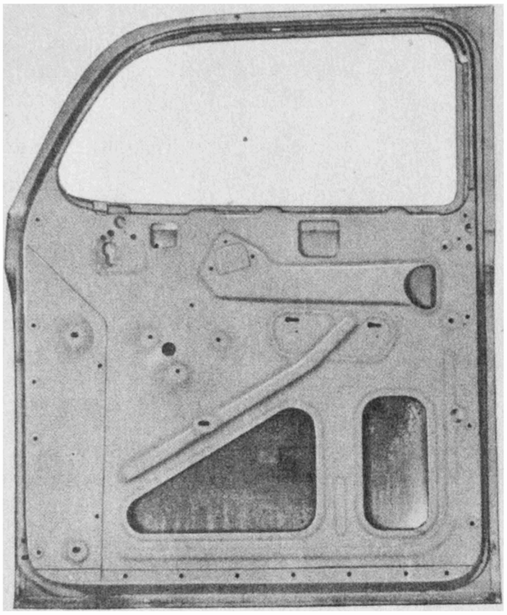


Figure 5—Sedan Right Front Door; Stage "A" or Skeleton.

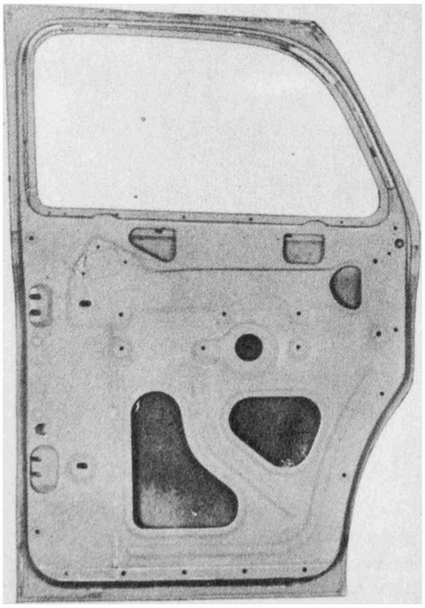


Figure 5-A—Sedan Right Rear Door; Stage "A" or Skeleton.

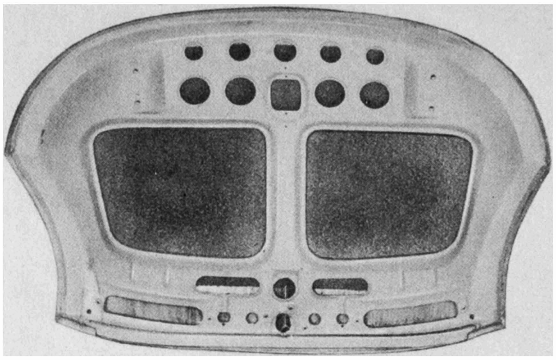
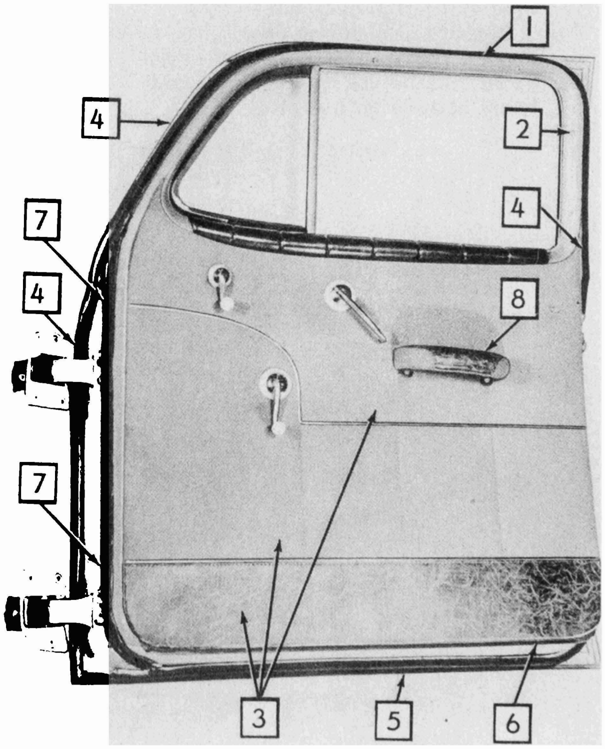


Figure 5-B—Deck Cover (Inside View).

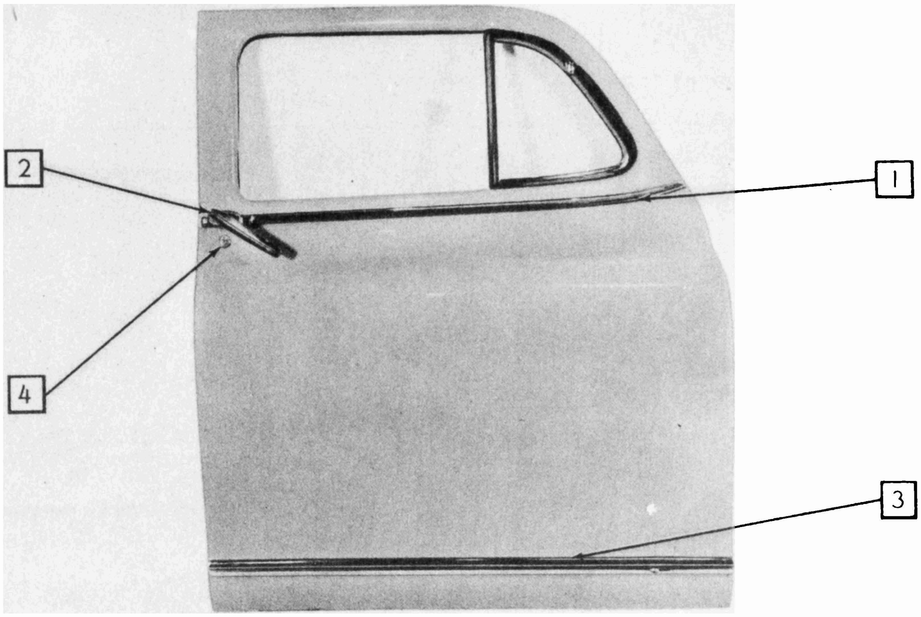
6. FRONT DOOR INSIDE AND OUTSIDE TRIM PARTS

1949 "600" and "Ambassador 6" Series



1. Finish molding and overlay assembly (Subject 14)
2. Finish molding screws (Subject 14)
3. Trim panel assembly (Subject 18)
4. Sealer rubber top and sides (Subject 42)
5. Sealer rubber bottom outer (on door) (Subject 42)
6. Sealer rubber bottom inner (on trim panel) (Subject 42)
7. Sealer rubber hinge side inner (Subject 42)
8. Arm rest (Subject 17)

Figure 6—Right Front Door (Inside).



1. Belt molding (Subject 44)
2. Handle (Subject 12)
3. Lower molding (Subject 44)
4. Key lock (Subjects 13-19)

Figure 6-A—Right Front Door (Outside).

7. PARTS ASSEMBLED—RIGHT FRONT DOOR

1949 "600" and "Ambassador 6" Series

Listed below for convenience and reference, are the names of the various parts used in the door, see Figure 7.

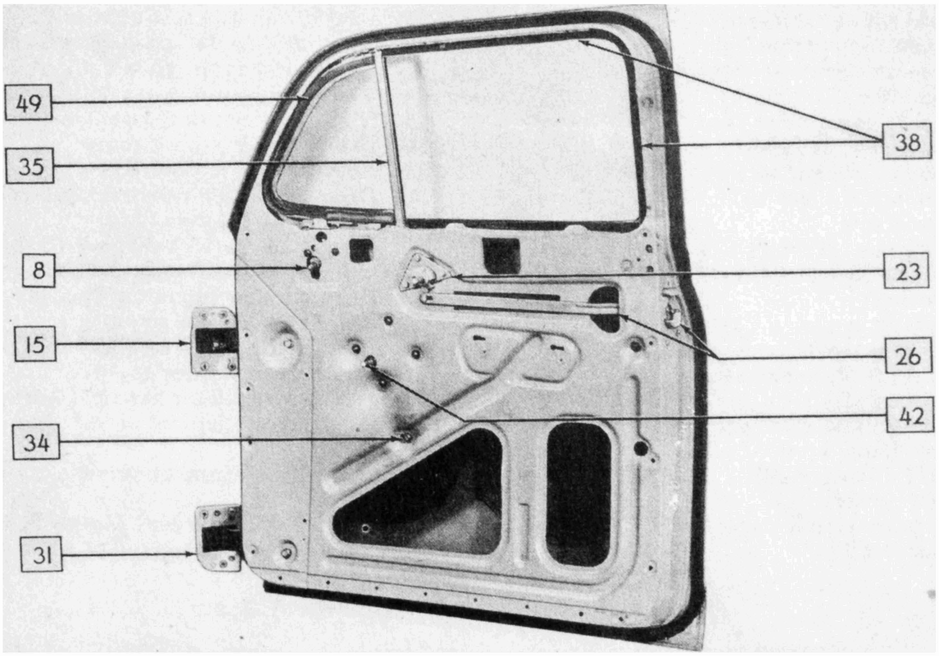
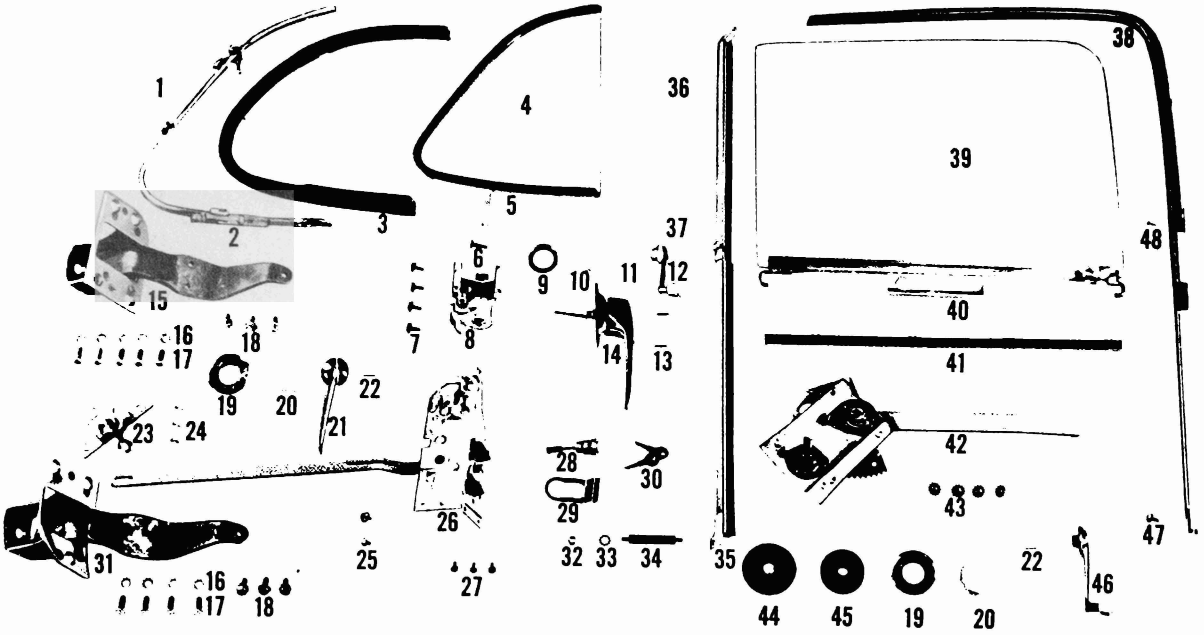


Figure 7—Parts Assembled—Right Front Door. (See Figure 8 for Identification of Parts.)

8. PARTS REMOVED—RIGHT FRONT DOOR



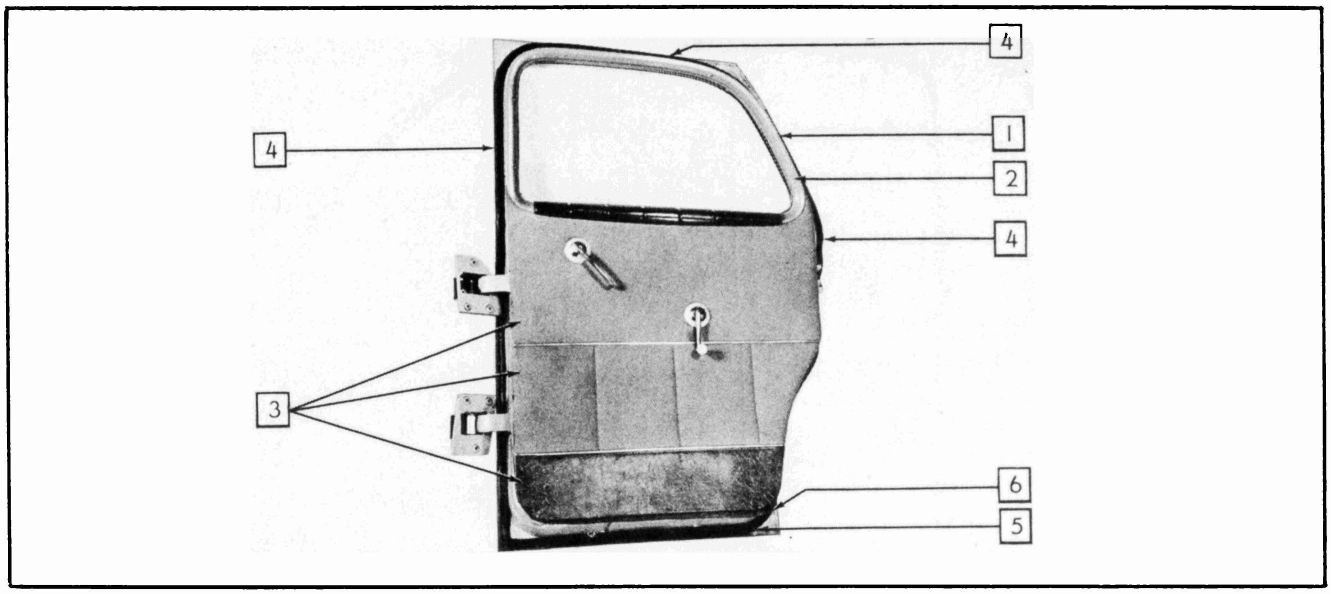
1. Ventilation channel screws
2. Ventilation channel (Subject 24)
3. Ventilator rubber weatherstrip (Subject 24)
4. Ventilator glass (Subject 24)
5. Ventilator glass frame (Subject 24)
6. Regulator to ventilator screw
7. Regulator to door and frame screw
8. Ventilator regulator (Subject 24)
9. Ventilator handle escutcheon base
10. Ventilator handle escutcheon
11. Ventilator handle retainer spring (Subject 16)
12. Ventilator handle (Subject 16)
13. Handle to door screw
14. Outside door handle (Subject 12)
15. Door upper hinge (Subjects 34-39)
16. Door hinge washer
17. Door hinge to post screw
18. Door hinge to door screw
19. Remote control handle escutcheon base
20. Remote control handle escutcheon
21. Remote control handle (Subject 15)
22. Remote control handle pin
23. Remote control (Subject 20)
24. Control to door screw
25. Lock to door screw (inner panel)
26. Door lock (Subject 22)
27. Lock to door screw (door pillar)
28. Cylinder lock (Subjects 13-19)
29. Cylinder lock retainer spring (Subject 13)
30. Cylinder lock keys
31. Door lower hinge (Subject 39)
32. Ventilator center glass division bar nut
33. Ventilator center glass division bar lock washer
34. Ventilator center glass division bar stud
35. Ventilator center glass division bar (Subject 25)
36. Division bar to door screw
37. Division bar to door screw
38. Door glass slide channel (Subject 29)
39. Door glass (Subject 31)
40. Door glass bottom channel (Subject 31)
41. Door glass weatherstrip (body side)
42. Door window regulator (Subject 26)
43. Regulator to door screw
44. Escutcheon washer (fiber)
45. Escutcheon washer (rubber)
46. Window regulator handle (Subject 15)
47. Glass slide channel screw (lower ends) (Subject 29)
48. Glass slide channel screw (upper sides) (Subject 29)
49. Ventilator assembly, Figure 7, includes items 2-3-4-5 (Subject 24)

Figure 8—Parts Removed—Right Front Door.

***NOTE:** The above numbers apply also to Figure 7.*

9. REAR DOOR INSIDE AND OUTSIDE TRIM PARTS

1949 "600" and "Ambassador 6" Series



1. Finish molding and overlay assembly (Subjects 14-55)
2. Finish molding screws
3. Trim panel assembly (Subject 18)
4. Sealer rubber top and sides (Subject 42)
5. Sealer rubber bottom outer (on door) (Subject 42)
6. Sealer rubber bottom inner (on trim panel) (Subject 42)

Figure 9—Right Rear Door (Inside).

10. PARTS ASSEMBLED—RIGHT REAR DOOR

1949 "600" and "Ambassador 6" Series

Each part is numbered to conform with the part removed from the door, as shown in Figure 11.

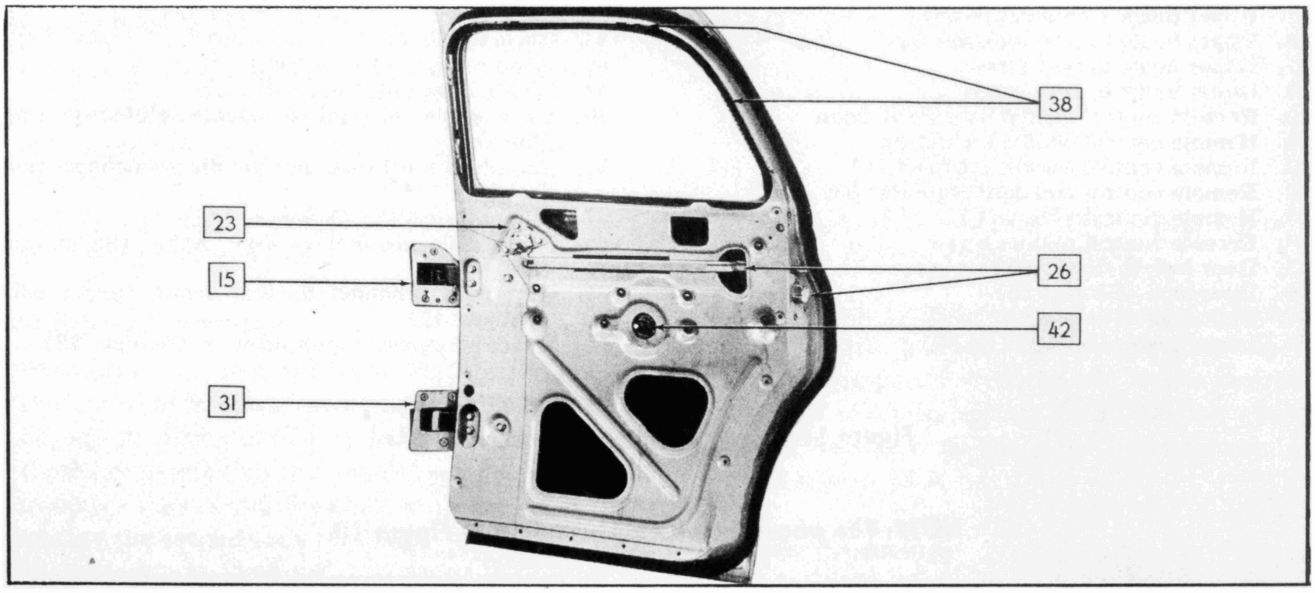
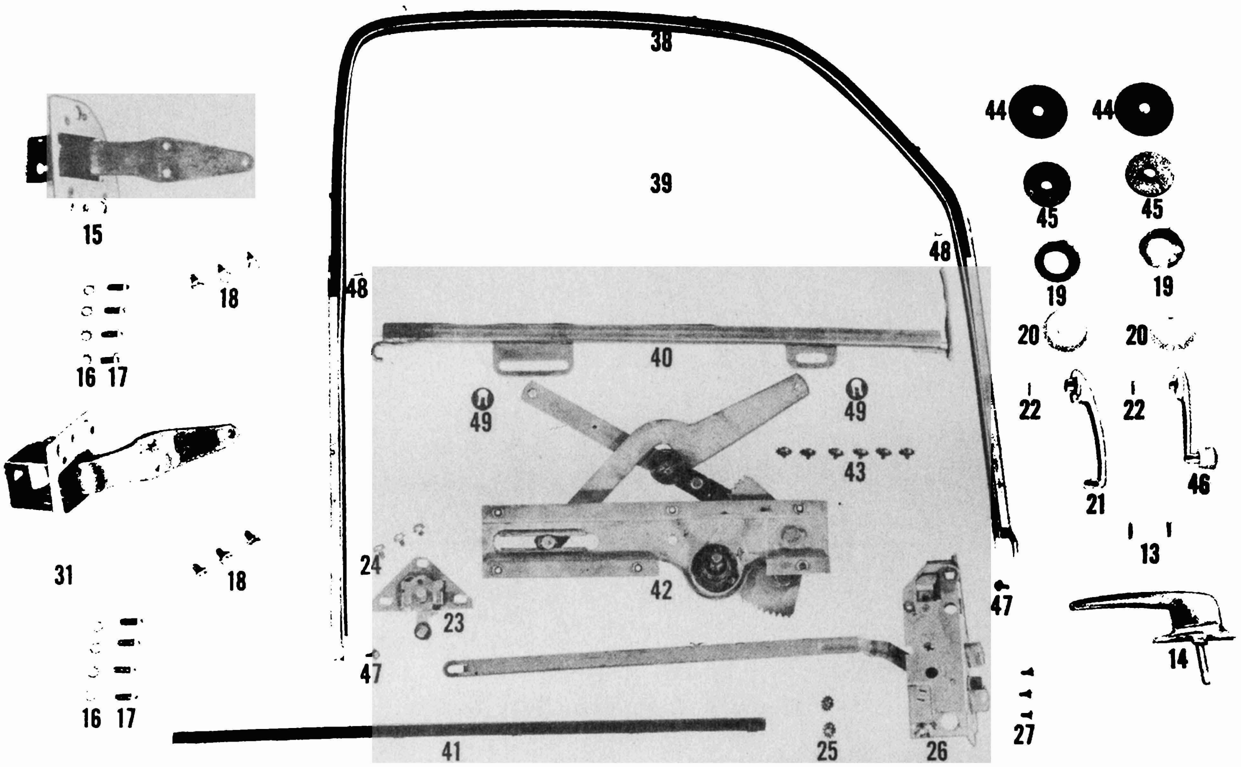


Figure 10—Parts Assembled—Right Rear Door. (See Figure 11 for Identification of Parts.)

11. PARTS REMOVED—RIGHT REAR DOOR

1949 "600" and "Ambassador 6" Series



13. Handle to door screw
14. Outside door handle (Subject 12)
15. Upper hinge (Subjects 34-39)
16. Upper hinge to post lock washer
17. Upper hinge to post screw
18. Upper hinge to door screw
19. Remote control handle base escutcheon
20. Remote control handle escutcheon
21. Remote control handle (Subject 15)
22. Remote control and door regulator pin
23. Remote control (Subject 21)
24. Remote control to door screw
25. Door lock to door screw
26. Door lock (Subject 23)
27. Door lock to door screw
31. Lower hinge (Subjects 34-39)
38. Glass slide channel (Subject 30)
39. Glass (Subject 32)
40. Glass bottom channel (Subject 32)
41. Glass weatherstrip (body side)
42. Window regulator (Subject 28)
43. Window regulator to door screw
44. Remote control regulator handle escutcheon washer (fiber)
45. Remote control regulator handle escutcheon washer (rubber)
46. Regulator handle (Subject 15)
47. Glass slide channel to door screw (lower ends) (Subject 30)
48. Glass slide channel to door screw (upper sides) (Subject 30)
49. Window regulator stud retainer (Subject 28)

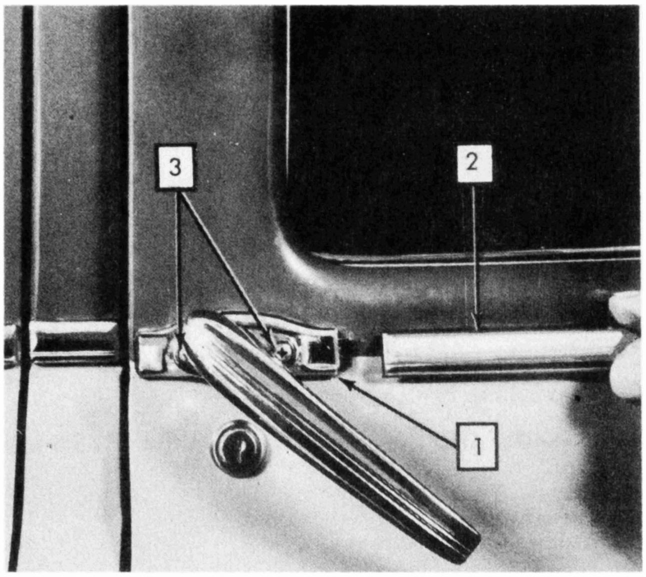
Figure 11—Parts Removed—Right Rear Door.

NOTE: The above numbers also apply to Figure 10.

12. OUTSIDE DOOR HANDLE

1949 "600" and "Ambassador 6" Series

The door handle escutcheon is in line with the belt molding which covers the end of the escutcheon. (Fig. 12.) Therefore, the belt molding must first be removed before the handle escutcheon can be removed. See BELT MOLDING REMOVAL, Subject No. 44.



1. Handle escutcheon
2. Belt molding
3. Handle screws

Figure 12—Releasing Handle Escutcheon by Removing Belt Molding.

Removal Procedure

1. Remove belt molding (Subject 44).
2. Turn handle down as far as possible and remove two screws holding handle to door (item 3, Fig. 12).
3. Pull lightly on door handle to disengage handle shaft from lock and door.

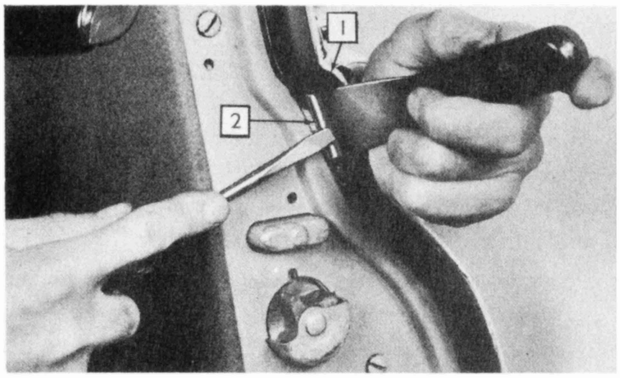
Installation Procedure

4. With handle in horizontal position, insert handle shaft into lock as far as possible. This should engage the first tumbler of the door lock. With constant pressure on the handle, and by turning it slowly downward, the shaft will line up and engage the second lock tumbler.
5. Turn handle down as far as possible, and install screws holding handle to door.
6. Install belt molding (Subject 44).

13. KEY LOCK—FRONT DOORS

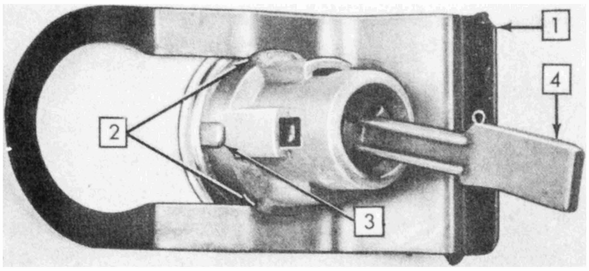
1949 "600" and "Ambassador 6" Series

An opening is provided in the door lock pillar through which the cylinder lock retaining spring is operated. This opening is partially concealed by the door sealer rubber (Fig. 13).



1. Door sealer rubber
2. Retaining spring

Figure 13—Removing Key Lock Retaining Spring. (For Key Lock Removal—Front Doors.)



1. Retainer spring
2. Groove in cylinder lock
3. Holding boss
4. Lock shaft

Figure 13-A—Door Key Lock Retaining Spring in Groove of Cylinder Lock.

The key lock cylinder is provided with a groove on the top and bottom. The retaining spring is inserted in this groove after the key lock is inserted through the retaining spring. This retaining spring holds the key lock to the door outer panels, as shown in Figure 13-A.

Removal Procedure

1. With key in lock and door open, carefully insert putty knife between door sealer rubber and exposed end of retaining spring (Fig. 13).

2. With screw driver, press retaining spring in against putty knife and pry out about one inch. This will slide the retaining spring from the grooves in the lock to the round opening, releasing the lock for removal through the round opening in the retaining spring and from the door, as shown in Figure 13-A.

Installation Procedure

3. Put inner locking device in UNLOCKED POSITION. Insert screw driver from outside of door into locking device through hole in door used for cylinder lock. Now turn it to right as far as possible in right door (and to the left as far as possible in left door).
4. Put key in cylinder lock. Turn it to right as far as possible. Note holding boss on lock housing casting, (item 3, Fig. 13-A). Line this boss up with edge of hole in door outer panel. This will position lock housing for installation in door.

   Now with lock housing in proper position for installation, turn key to left, or vertical position. This will turn the lock shaft to proper position for entrance into the locking device of the door lock (item 4, Fig. 13-A).
5. Align round hole in retaining spring with hole in outer door panel.
6. Insert cylinder lock through door panel and retaining spring and into door lock. Hold cylinder lock firm against door outer panel. Push in retaining spring flush against door lock pillar. Then use screw driver to set retaining spring in its locked position in door pillar under edge of sealer rubber.

NOTE: *In dusty territories, exposed locks should be thoroughly cleansed with a solvent to carry off any foreign matter or gummy substance. Gasoline (one that does not contain lead) may be used, or the lock may be removed and cleaned with alcohol or benzol. Blow out with air hose, and lubricate.*

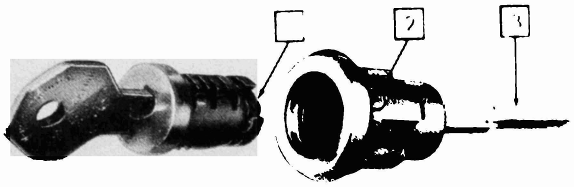
Lubrication

7. Finely powdered graphite is recommended for lubrication.

Removing Key Cylinder from Housing

8. To remove key lock cylinder from housing, first remove the key lock cylinder housing from the door, then insert the keys in lock and turn to left as far as possible. In this position, pull key cylinder from housing (Fig. 13-B). While tumblers are exposed they should be thoroughly cleaned and lubricated.

Install lock cylinders by reversing removal procedure.



1. Slot in key cylinder
2. Boss on housing
3. Handle shaft (flat edge)

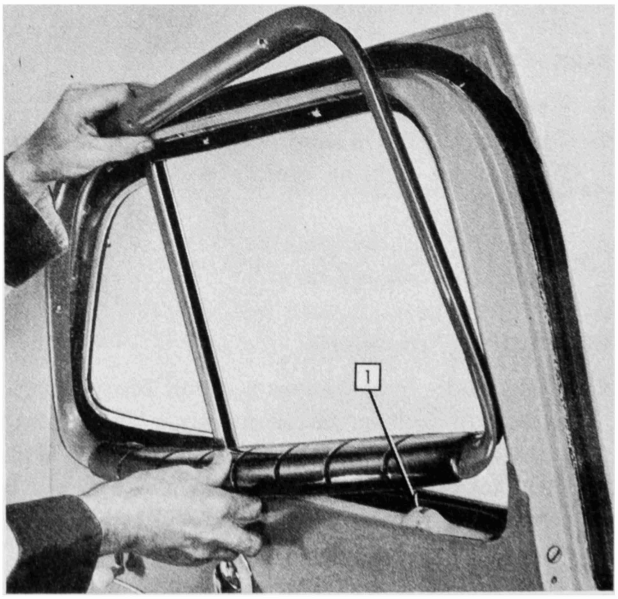
Figure 13-B—Removing Key Lock Cylinder from Housing.

14. DOOR FINISH MOLDINGS

1949 "600" and "Ambassador 6" Series

Removal Procedure

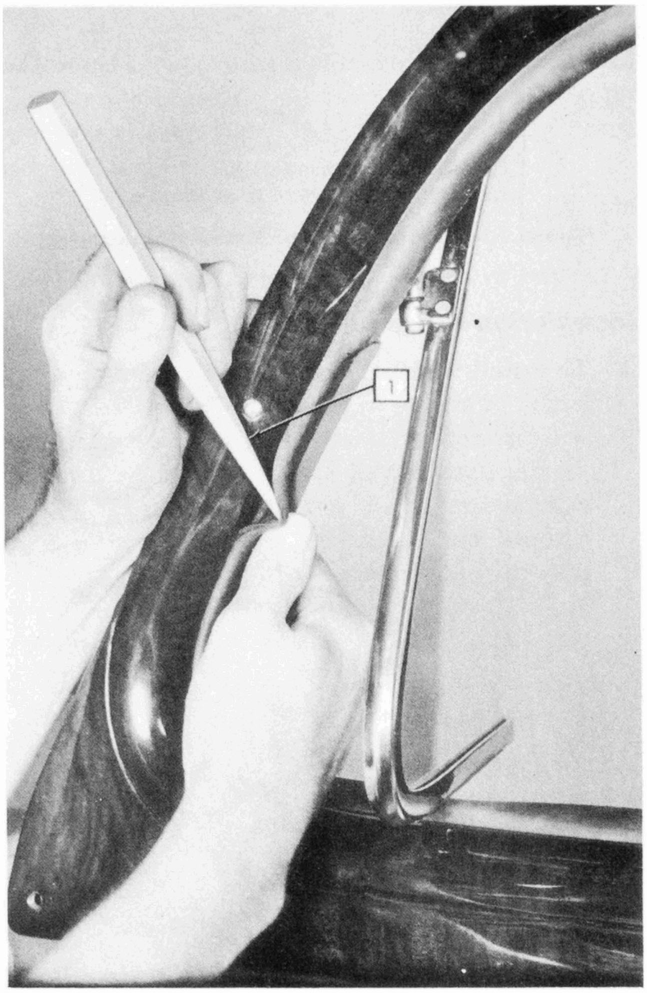
1. Lower window glass.
2. Remove all visible screws which hold molding to door.
3. Pull molding away from door at top, lifting up to unhook it from door inner panel (Fig. 14).



1. Lift up to unhook from door inner panel

Figure 14—Removing Door Finish Molding.

4. When installing finish molding on front doors, before tightening screws, lift lip of ventilator rubber weatherstrip over top of finish molding. Use pointed wood wedge as shown in Figure 14-A. Screw driver or any metal may damage finish on molding.



1. Wooden wedge

Figure 14-A—Lifting Lip of Ventilator Rubber over Finish Molding.

5. Open and close ventilator to check clearance between ventilator glass frame and rubber, adjusting finish molding as necessary to provide free operation and tight closure.
6. Should the upholstery wrinkle slightly on top of door trim panel when finish molding is installed, it can be straightened under molding by using a putty knife (Fig. 14-B). If upholstery is loose from top of trim panel, re-cement it to trim panel rag board, using trim rubber cement, or staple top edge of upholstery to rag board, using paper stapler.

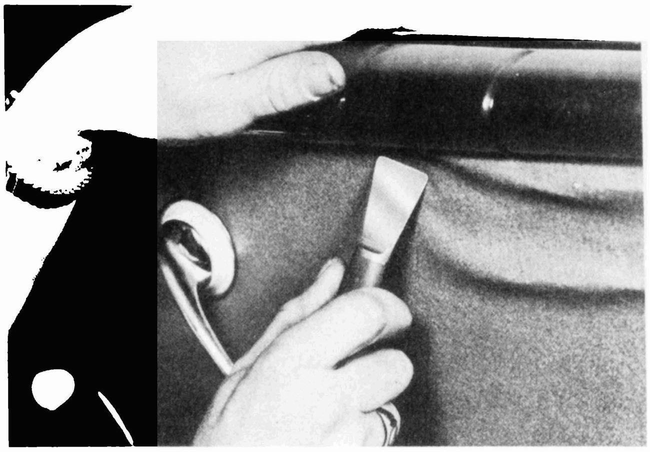


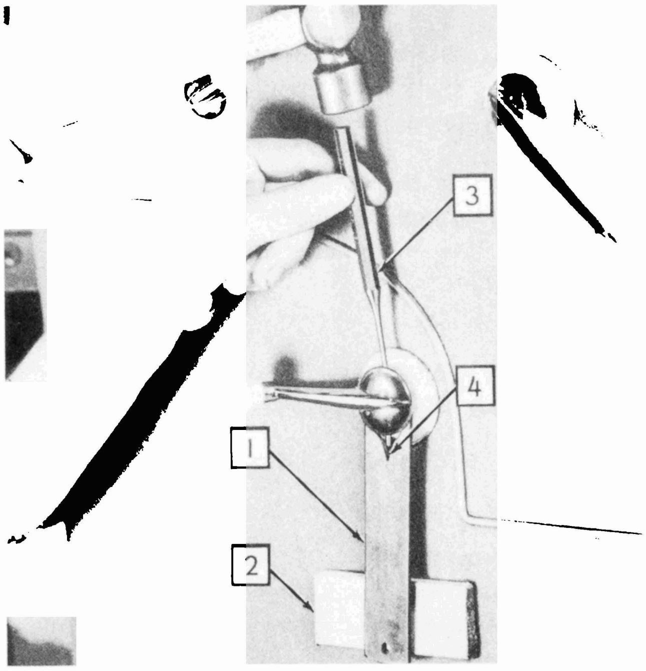
Figure 14-B—Straightening Upholstery under Finish Molding with Dull Putty Knife.

15. REMOTE CONTROL AND WINDOW REGULATOR HANDLES

1949 "600" and "Ambassador 6" Series

Removal Procedure

Insert depressor tool (J-2987) between handle and escutcheon. This will expose the handle pin, which may be driven out with a thin pointed punch, as shown in Figure 15.

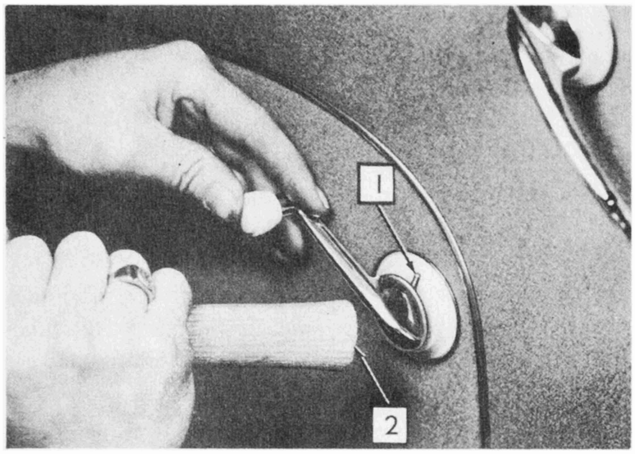


1. Depressor (J-2987)
2. Wood block to hold tension on depressor
3. Drift
4. Handle pin

Figure 15—Removing Window Regulator Handle.

Installation Procedure

1. Set remote control handles at uniform angles on all doors.
2. Set window regulator handles pointing down when windows are in a closed position.
3. Install escutcheon and chrome base on shaft.
4. Install handle in proper position with pin inserted in top half of handle hole.
5. Hold end of handle, pressing in against escutcheon. Use end of hammer handle to drive handle on shaft to proper position so the pin may be tapped lightly to engage hole in shaft, as shown in Figure 15-A.



1. Pin
2. End of hammer handle

Figure 15-A—Installing Window Regulator Handle.

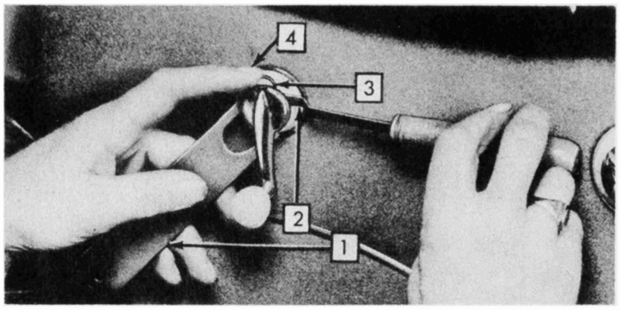
6. Place screw driver or thin pointed punch on end of pin, tapping lightly until it is flush with handle. The escutcheon will return to its place over the pin.

16. VENTILATOR HANDLE—FRONT DOOR

1949 "600" and "Ambassador 6" Series

Removal Procedure

1. Insert depressor tool (J-2987) between handle and escutcheon, prying out until slot in handle under escutcheon is exposed. Hold your finger over top of handle to prevent retaining spring from flying out when released, as shown in Figure 16.
2. With spring removal tool inserted in slot of handle, lift up retaining spring, releasing handle from shaft so it may be removed from door.

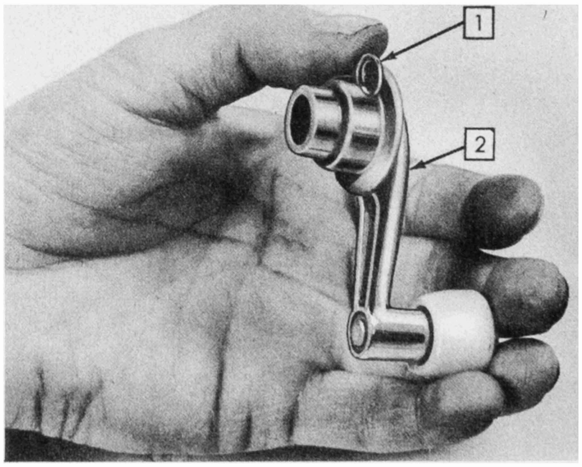


1. Depressor (J-2987)
2. Spring removing tool
3. Retaining spring
4. Hold finger over top of handle

Figure 16—Removing Door Ventilator Handle.

Installation Procedure

3. To install ventilator handle, set retaining spring in slot of handle as shown in Figure 16-A. Then, with thumb or screw driver, press spring into handle until top of spring is flush with top of slot. Insert small screw driver or drift into opening and adjust ends of retainer spring so they are spaced equally in the opening.



1. Retaining spring
2. Ventilator handle

Figure 16-A—Installing Retainer Spring in Door Ventilator Handle.

4. With ventilator closed, install escutcheon chrome base, then escutcheon and handle on shaft. With the knob pointing down, push in handle until retaining spring engages slot in shaft. This may also be tapped on with hammer handle as shown in Figure 15-A.

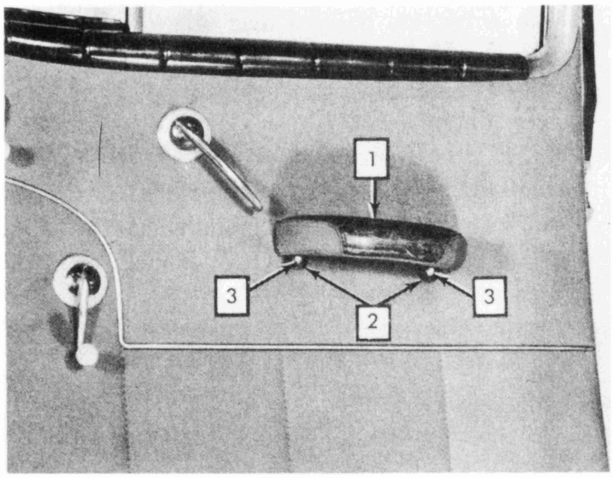
17. FRONT DOOR ARM REST

1949 "600" and "Ambassador 6" Series

The arm rest bracket to which the rubber pad and upholstery is applied has two small grooved lugs. When the arm rest is installed on the door, these lugs are inserted in the keyway slot of the door inner panel, then moved toward the door lock pillar about ½ inch. The slots in the lugs slide in the keyway slot, which provides an upper anchorage for the arm rest. To fasten the arm rest to the door, two screws are inserted through the lower support arms of the arm rest bracket.

Removal Procedure

1. Remove two screws and washers at bottom of arm rest of door (Fig. 17).



1. Arm rest
2. Arm rest bracket
3. Screws

Figure 17—Door Arm Rest—Right Front Door.

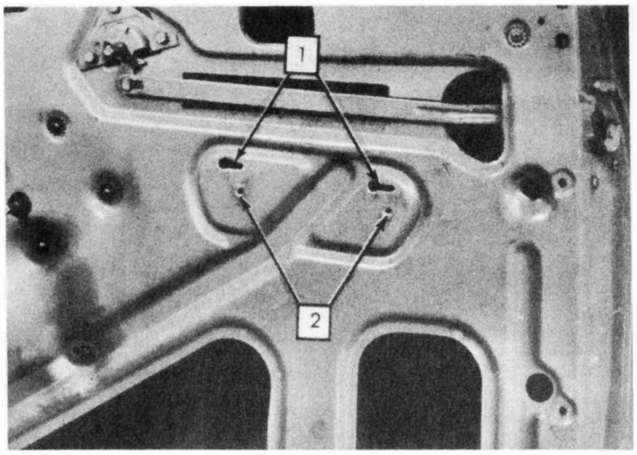
2. Push arm rest against door. Lightly tap or push arm rest about ½ inch toward hinge pillar. This will slide the arm rest lugs to the opening of the keyway slots and disengage them from the door inner panel (Fig. 17-A).

CAUTION: *Use care to see that the arm rest lugs do not tear the upholstery.*

To Install, Reverse Procedure

Lubrication

3. When installing arm rests, place stainless lubricant in grooves of arm rest lugs to prevent noise developing from metal-to-metal contact with door inner panel.



1. Keyway slots
2. Arm rest fastening screw holes

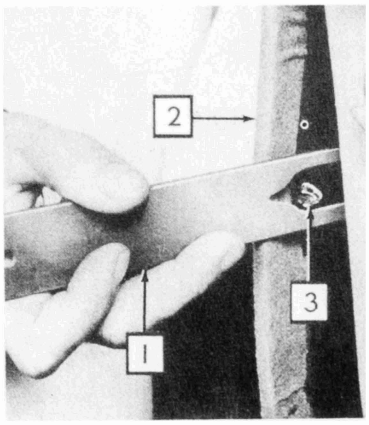
Figure 17-A—Arm Rest Keyway Slots—Right Front Door.

18. DOOR TRIM PANEL

1949 "600" and "Ambassador 6" Series

Removal Procedure

1. Remove finish molding (Subject 14).
2. Remove remote control and window regulator handles (Subject 15).
3. Remove ventilator handle on front doors (Subject 16).
4. Remove door arm rest on front doors (Subject 17).
5. Remove trim panel, by using handle depressor tool (J-2987) to lift fasteners from door inner panel, as shown in Figure 18. Avoid damage to fasteners or trim panel.



1. Depressor tool (J-2987)
2. Door trim panel
3. Fastener

Figure 18—Removing Door Trim Panel.

To Install, Reverse Procedure

CAUTION: *Care should be exercised when installing the trim panel. Be sure the clips line up with the holes in the door metal panel.* PRESS THE CLIPS IN. DO NOT HAMMER THEM.

19. CAR KEYS AND LOCK OPERATION

1949 "600" and "Ambassador 6" Series

Keys

The key locks are controlled by two keys. The octagon-head key operates the front door and ignition locks. The round-head key operates the glove compartment and trunk locks.

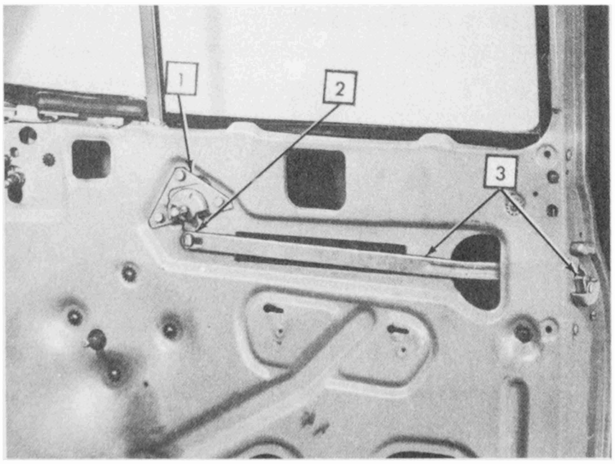
A code number, stamped on each key, tells the code number of the lock it operates. Coded keys are available in service when ordered by special part number. The code number stamped on the key should be furnished with the order.

Coded locks with keys are available in service when ordered by special part number for the lock wanted. The code number stamped on the keys should be furnished with the order.

20. REMOTE CONTROL—FRONT DOORS

1949 "600" and "Ambassador 6" Series

The front door remote control unit has only one coil spring, which serves as a handle return spring. This spring keeps the door lock operating lever in a neutral position (Fig. 20).



1. Remote control unit
2. Remote control operating lever
3. Lock and link

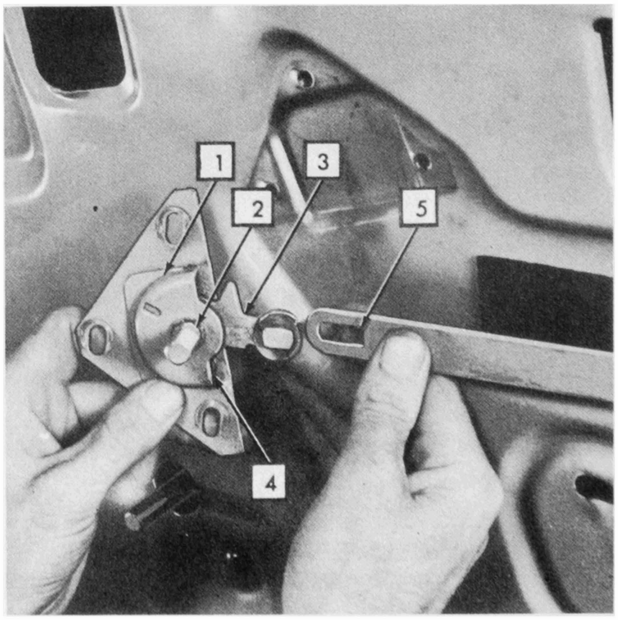
Figure 20—Remote Control and Lock Set in Neutral Position—Right Front Door.

When the remote control handle is pushed down, it moves the lock operating lever and lock link forward. This releases the door lock. The handle return spring will return the lock operating lever and lock link to the neutral position.

When the handle is raised, it moves the lock operating lever and link toward the door lock. This moves the door lock cams into a locked position. The handle return spring will return the lock operating lever and remote control handle to the neutral position without moving the locking cams. They will remain in a locked position until the remote control handle is moved to the full forward position for opening the door, or until the key is used to unlock the door.

Removal Procedure

1. Remove finish molding (Subject 19).
2. Remove remote control and window regulator handles (Subject 15).
3. Remove ventilator handle (Subject 16).
4. Remove arm rest (Subject 17).
5. Remove door trim panel (Subject 18).
6. Remove three screws in remote control unit of door inner panel. Turn remote control unit down and disconnect from link (Fig. 20-A).



1. Remote control unit
2. Handle shaft
3. Lock operating lever
4. Return spring
5. Link

Figure 20-A—Removing Remote Control Unit from Right Front Door.

Installation Procedure

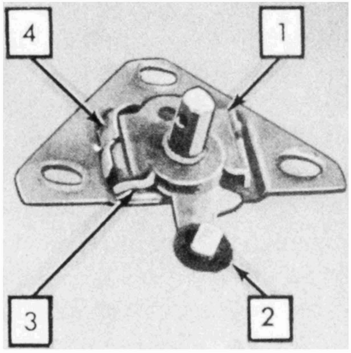
1. Apply Lubriplate to all bearing surfaces inside remote control unit.
2. Connect remote control lock operating lever to lock link.
3. Install three screws finger tight in remote control unit of door inner panel.
4. With the remote control lock operating lever in neutral position, adjust lock link to neutral position. To do this, move remote control and link toward hinge post until all free movement is taken up. Then tighten screws.

   CAUTION: *Before installing trim panel and hardware, check operations 5, 6 and 7, Installation Procedure,* REMOTE CONTROL—REAR DOOR.
5. Reverse removal procedure, items 1 through 5.

21. REMOTE CONTROL—REAR DOOR

1949 "600" and "Ambassador 6" Series

The rear door remote control unit has two springs. One, a coil spring, serves as a handle return spring. It returns the handle from the full open, or forward, position to the full locked, or raised, position (item 3, Fig. 21).



1. Remote control unit
2. Operating lever
3. Return spring
4. Remote control spring

Figure 21—Remote Control Unit—Right Rear Door.

The other, a remote control spring, serves as a counter spring. It retards the action of the coil spring on the control operating lever when the lever is being moved from the neutral position to the locked or raised position. This spring holds the handle in the locked position, until it is released by pushing the door handle down to the neutral position (item 4, Fig. 21).

Without the coil spring the handle would remain in the open position and the door would not latch when closed.

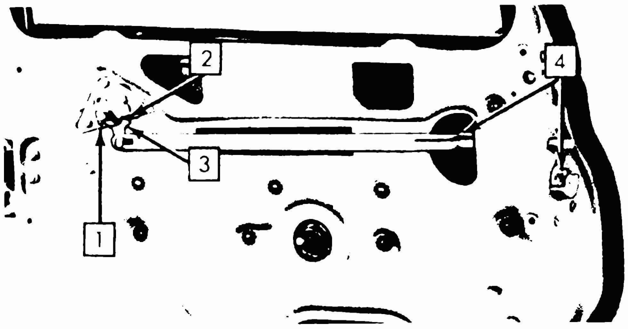
Without the remote control spring, the door would remain closed and locked until it was opened by the remote control handle.

Removal Procedure

1. Remove finish molding (Subject 14).
2. Remove remote control and window regulator handles (Subject 15).
3. Remove door trim panel (Subject 16).
4. Remove three screws holding remote control unit to door inner panel. Turn remote control unit down and disconnect from link (Fig. 20-A).

Installation Procedure

1. Apply Lubriplate to all bearing surfaces inside remote control unit.
2. Connect remote control lock operating lever to lock link.
3. Raise control operating lever (item 3, Fig. 21-A) against stop on remote control (item 2, Fig. 21-A). Move lock link toward lock as far as possible. (This places both units in a locked position.)



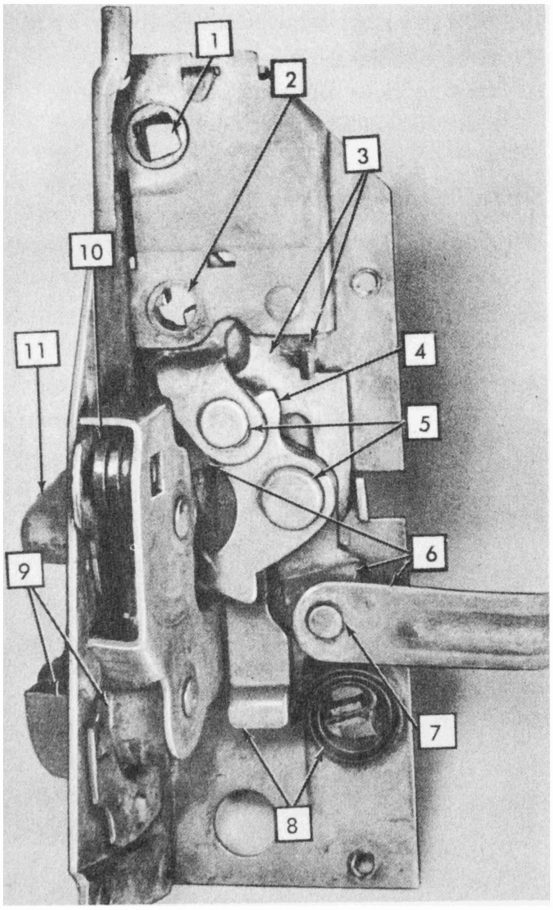
1. Remote control unit
2. Stop on remote control unit
3. Stop on operating lever
4. Lock and link

Figure 21-A—Installing Remote Control.

4. Install screws through remote control unit into door inner panel and tighten them.

   NOTE: *The elongated holes in the remote control unit permit proper adjustment.*
5. With window down and door closed, open door from inside, using remote control handle. If door lock does not release, move remote control *away* from door lock.

6. With window down and door open, raise remote control handle as if locking door from inside. Then close door. This should trip the locking device so that the door can be opened by using the outside door handle.
7. If door cannot be opened by outside door handle, move remote control unit *toward* door lock.
8. Install finish molding, remote control and window regulator handles, and trim panel.



1. Handle entrance and lock mechanism
2. Key lock entrance and mechanism
3. Handle shaft and stop
4. Stop on key lock cams
5. Key lock cams
6. Remote control link and link cams
7. Remote control link rivet
8. Handle return spring and lower end of handle shaft (item 3)
9. Lock rotor
10. Rotor springs and cams
11. Female dovetail

Figure 22—Right Front Door Lock and Link in Unlocked Position. Stop on Key Lock Cams (item 4) Moved in so that Stop on Handle Shaft (item 3) can move down.

22. DOOR LOCK—FRONT DOOR

1949 "600" and "Ambassador 6" Series

The door locks are rotor type and serve as a female dovetail. (Refer to the combination lock striker and male dovetail No. 40.)

Operation of Lock

Opening Door from Outside

When the outside door handle is turned (see Fig. 22) in the handle entrance and lock mechanism (item 1), this moves the lock handle shaft (items 3 and 8) downward. This releases the rotor springs and cams (item 10). In this position the door can be opened. The handle return spring (item 8) forces the handle shaft upward, returning the outside handle to the horizontal position.

Opening Door from Inside

When the remote control link (item 6) is pulled forward it moves the link cams down, releasing the rotor springs and cams (item 10). In this position the door can be opened. This is an independent operation of parts not controlled by the outside door handle.

Locking with Key Lock

When the key lock is turned in the lock, it moves the key lock cams back (item 5, Fig. 22). The stop on the key lock cam (item 4) is now under the handle shaft. In this position (item 3), it blocks any movement of the handle shaft.

Locking with Remote Control

When the remote control handle is raised for locking, it pushes the link and the link cams (item 6) in toward the lock (Fig. 22), moving the key lock cams (item 5) out. The stop (item 4) is now under the handle shaft stop (item 3, Fig. 22-A), blocking any movement of the outside handle.

Unlocking

When the door is locked, either by **key** or by remote control handle, the key lock cams are operated (item 5). Therefore, regardless of whether the door was locked by a key or the remote control, either of these will unlock the door.

Unlocking by Closing Door

The rotor springs and cams (item 10) are controlled by a lever contacting the key lock cams (item 5). Therefore if the door lock is locked by key or remote control *while the door is open* the movement of the rotor in closing the door will move the key lock cams to the unlocked position. THE DOOR CAN ONLY BE LOCKED AFTER IT IS CLOSED.

This feature eliminates the possibility of locking the car and leaving the keys inside.

Removal Procedure

1. Remove belt molding (Subject 44).
2. Remove outside door handle (Subject 12).
3. Remove key lock (Subject 13).
4. Remove finish molding (Subject 14).
5. Remove remote control and window regulator handles (Subject 15).
6. Remove ventilator handle (Subject 16).
7. Remove arm rest (Subject 17).
8. Remove trim panel (Subject 18).

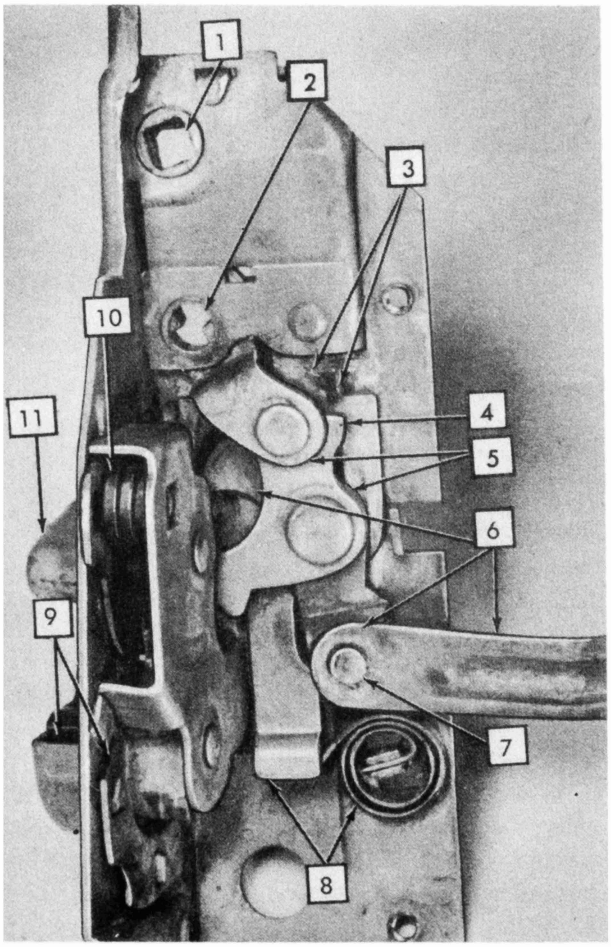
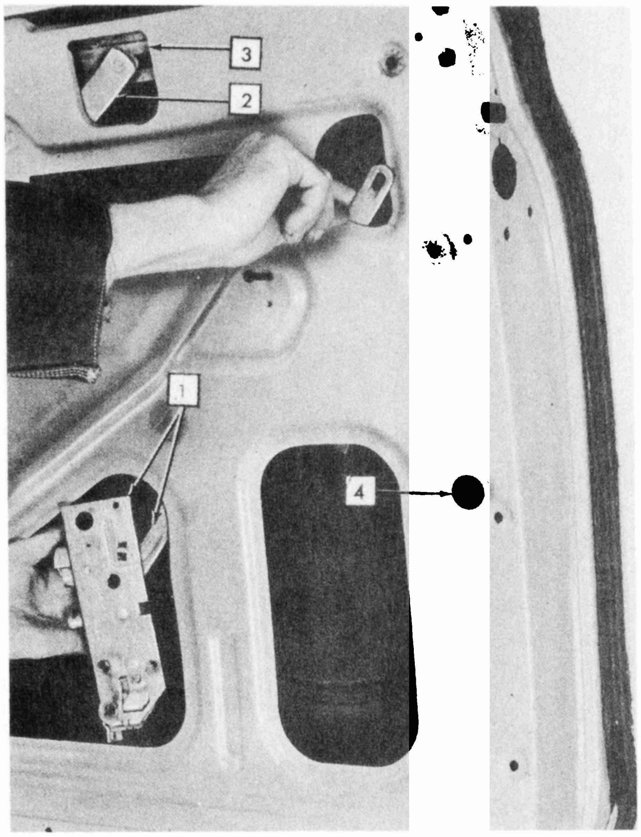


Figure 22-A—Right Front Door Lock and Link in Lock Position, No. 4 Stop on Key Lock Cams out and under No. 3 Stop on Handle Shaft.

NOTE: Numbered items of Figure 22 are also reference numbers for Figure 22-A.

9. Remove remote control (Fig. 20-A).
10. Raise glass.
11. Remove screw holding bottom of glass channel retainer to door on lock side.
12. Remove screws holding lock to door.
13. Push lock to inside of door, and move below glass channel retainer. Remove through opening in door inner panel, as shown in Figure 22-B.



1. Lock and link assembly
2. Window regulator arm
3. Glass bottom channel
4. Glass slide channel screw

Figure 22-B—Removing Door Lock and Link—Right Front Door.

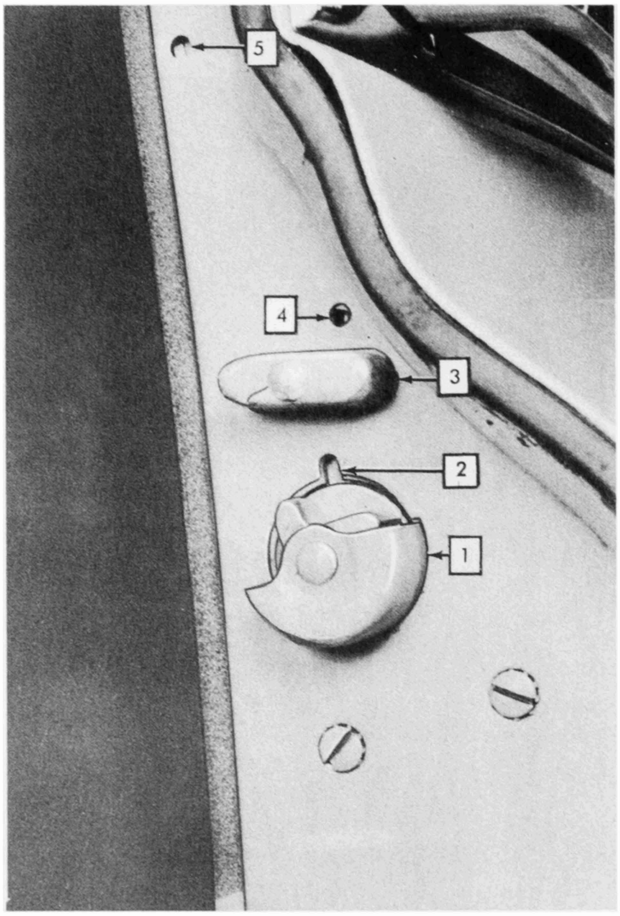
To Replace, Reverse Removal Procedure

14. Clean and lubricate lock before installing. Refer to DOOR LOCK LUBRICATION, Paragraph 3, below.

CAUTION: *Check the operation of the door handle, cylinder lock and inside remote control before installing trim panel and hardware. Refer to* REMOTE CONTROL, REAR DOOR, Subject 21, Installation Procedure Operations 5, 6 and 7.

Maintenance and Lubrication

1. Lubricate both sides of striker and rotor with Lubriplate.
2. Lubricate door lock mechanism, lock cams and rotor through three holes provided in face of door lock pillar. Use light motor oil. See Figure 22-C.



1. Rotor
2. Oil hole for rotor
3. Female dovetail
4. Oil hole for lock cams
5. Oil hole for lock mechanism

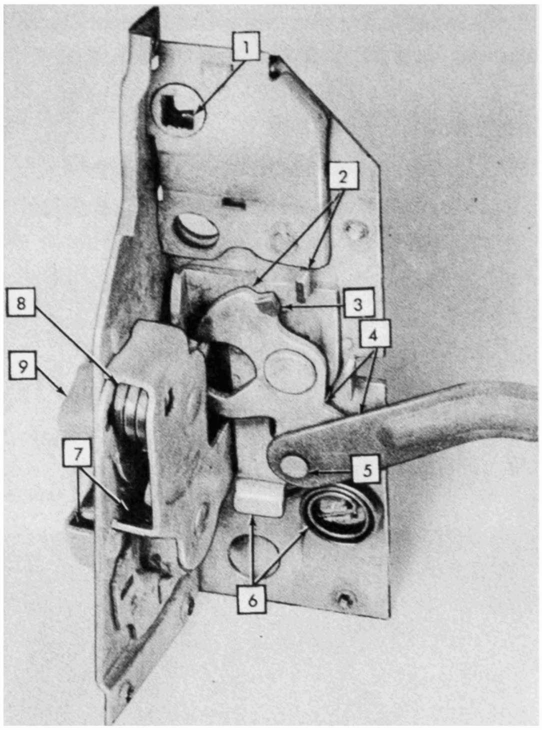
Figure 22-C—Door Lock Lubrication.

3. When lock has been removed, wash it with gasoline, then dry with air. Remove all dust, dirt and gum. Then apply Lubriplate to all working parts of lock.

23. REAR DOOR LOCKS

1949 "600" and "Ambassador 6" Series

The rear door locks are similar to the front door locks with the exception of the key lock entrance mechanism (item 2). Key lock cams (item 5) are shown in Figures 22 and 22-A.



1. Handle entrance and lock mechanism
2. Handle shaft and stop
3. Stop on remote control link cam
4. Remote control link and link cam
5. Remote control link rivet
6. Handle return spring and lower end of handle shaft (item 2)
7. Lock rotor
8. Rotor springs and cams
9. Female dovetail

Figure 23—Right Rear Door Lock and Link in Unlocked Position. Stop on Remote Control Link Cam (item 3) moved in so Stop on Handle Shaft (item 2) can be Moved Down.

NOTE: Numbered items for Figure 23 are also reference numbers for Figure 23-A.

These doors can only be locked by raising the remote control handle. Therefore the stop is on the remote control link cam (item 3, Figs. 23 and 23-A) instead of key lock cams (item 4, Figs. 22 and 22-A).

Removal Procedure

1. Remove finish molding (Subject 14).
2. Remove remote control and window regulator handles (Subject 15).

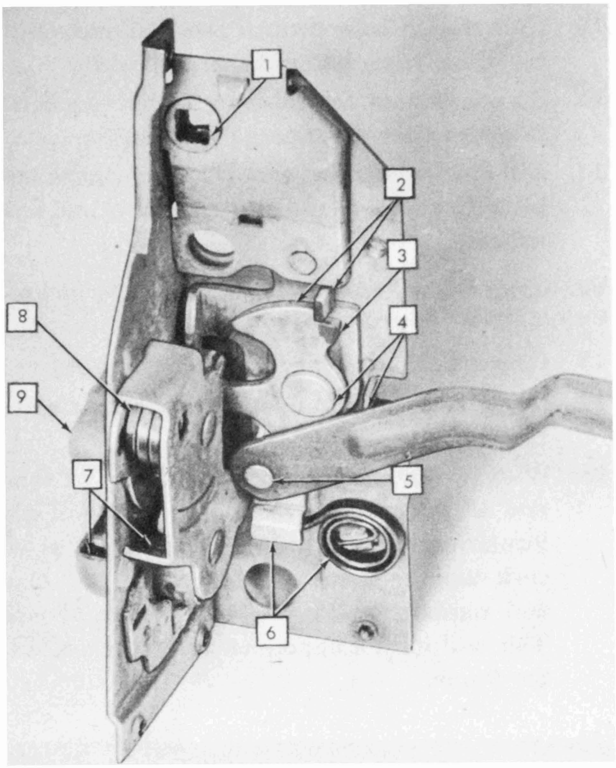
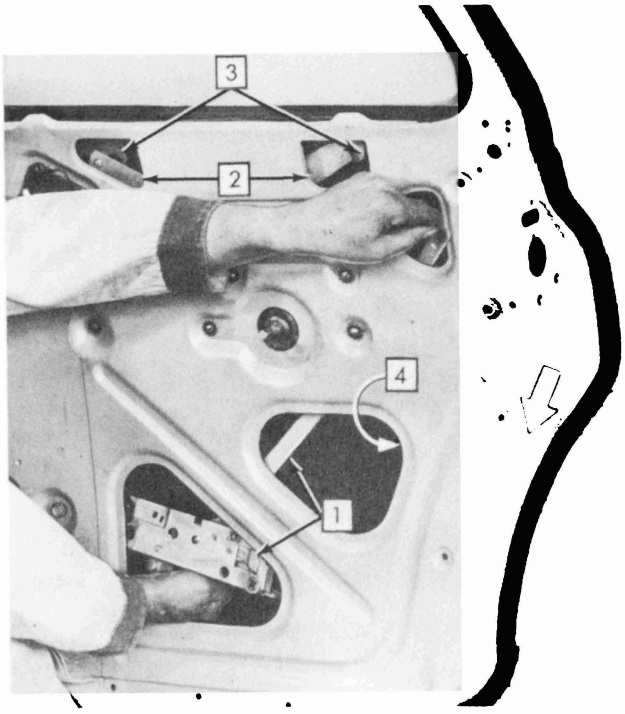


Figure 23-A—Right Rear Door Lock and Link in Locked Position. Stop on Remote Control Link Cam (item 3) moved out and under Stop on Handle Shaft (item 2). Refer to Figure 23 for Identification.

3. Remove door trim panel (Subject 18).
4. Remove door belt molding (Subject 44).
5. Remove outside door handle (Subject 12).
6. Raise door glass.
7. Remove screw holding side glass channel to door lock post at bottom (item 4, Fig. 23-B).
8. Remove remote control (Fig. 20-A).
9. Remove screws holding lock to door.
10. Push lock to inside of door and lower below glass channel retainer, removing lock through opening in door.
11. Clean and lubricate lock before installing. Refer to DOOR LOCK LUBRICATION, Subject 22, Paragraph 3.

To Replace, Reverse Removal Procedure

CAUTION: *Check operation of the door handle and the inside remote control before installing the trim panel and hardware. Refer to* REMOTE CONTROL, REAR DOOR, Subject 21, Installation Procedure Operations 5, 6 and 7.



1. Lock and link assembly
2. Window regulator arms
3. Glass bottom channel
4. Glass slide channel screw

Figure 23-B—Removing Door Lock and Link—Right Rear Door.

Lubrication

See DOOR LOCK LUBRICATION, Subject 22, Figure 22-C, Page 22.

24. FRONT DOOR VENTILATOR ASSEMBLY

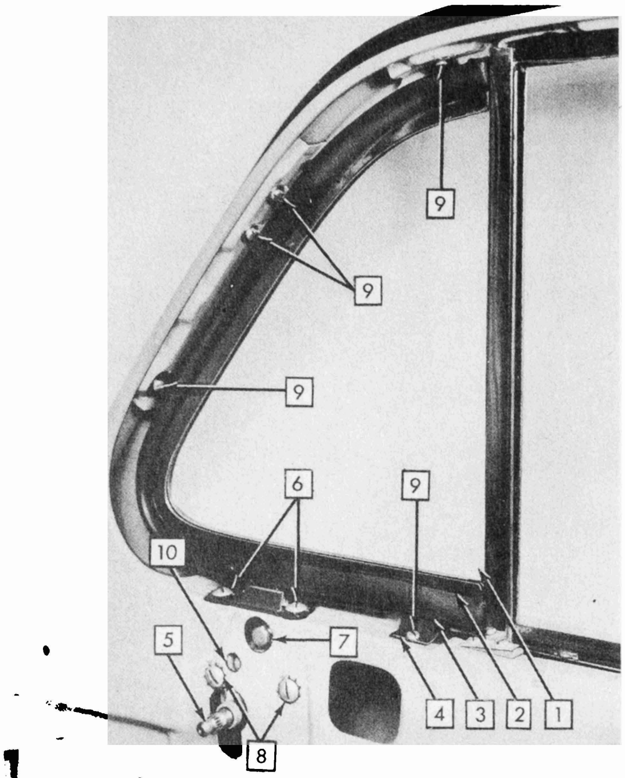
1949 "600" and "Ambassador 6" Series

The front door ventilator assembly (Fig. 24) consists of the glass (item 1), chrome frame (item 2), sealer rubber (item 3), and steel frame (item 4) assembled as one unit. The control (item 5) is another unit. Each of these units is serviced complete or in individual parts. The control unit is installed after the frame assembly is set into place in the door. In disassembly it should be removed before the frame assembly is removed.

Removal Procedure

Ventilator Control Removal

1. Remove finish molding (Subject 14).
2. Remove ventilator handle (Subject 15).



1. Glass (curved)
2. Chrome frame
3. Sealer rubber
4. Steel frame channel
5. Control
6. Screws—channel to control
7. Screw—frame shaft to control
8. Screws—control to door
9. Screws—steel frame to door
10. Handle adjustment screw

Figure 24—Front Door Ventilator Assembly.

3. Loosen door trim panel, hinge side only.
4. Remove two screws (item 6) holding ventilator channel to ventilator control.
5. Remove one screw (item 7) holding ventilator glass frame shaft to ventilator control.
6. Remove two screws (item 8) holding ventilator control to door inner panel. Lower the control unit until disengaged from glass frame shaft, and remove from door.

Ventilator Glass Frame and Channel Removal

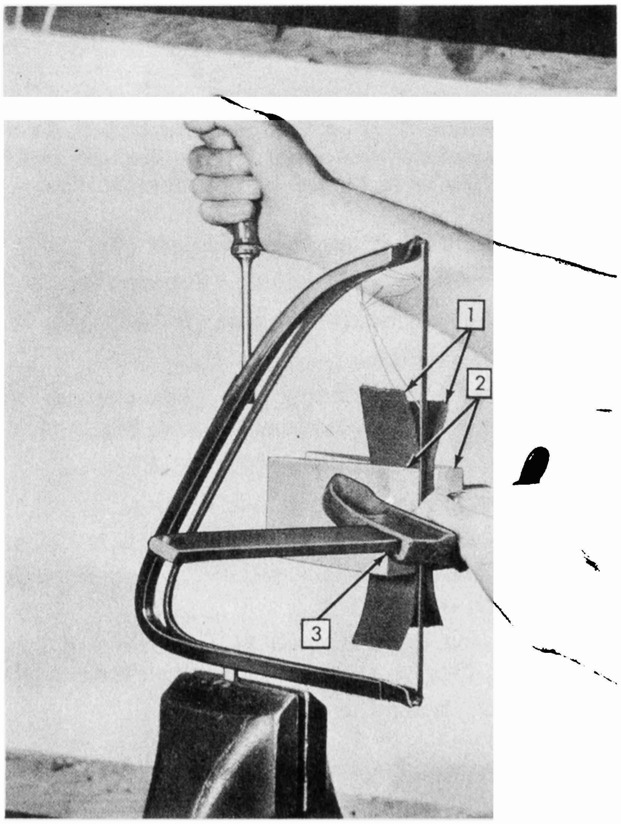
7. Follow vent control removal.
8. Remove five screws holding ventilator channel to door. (item 9, Fig. 24).
9. Open glass about 1". Pull top of ventilator channel toward inside of body, lifting complete unit out of door.

Ventilator Glass and Frame Removal

10. Follow ventilator control removal and ventilator glass frame and channel removal.
11. Spring top of ventilator channel enough to release upper pivot on glass frame.
12. Lift glass and frame enough to disengage lower pivot from slot in ventilator channel and sealer rubber.

Ventilator Glass Removal from Chrome Frame after Unit is Removed from Assembly

13. Clamp bottom pivot in vise (Fig. 24-A).
14. Slightly spread top and bottom of frame away from glass.
15. With two small blocks of wood about 3" square and 1" thick, apply one on each side of glass, insulating between wood block and glass with cork tape or strips of rubber. Use "C" clamp and tighten against the two blocks of wood. This will form a handle to pull the glass out of the frame.



1. Cork tape
2. Two wood blocks
3. Clamp

Figure 24-A—Removing Broken Glass from Ventilator Frame.

Ventilator Glass Removal from Chrome Frame

16. This may be accomplished with ventilator in door and no other parts removed. Open ventilator glass as far as possible and proceed with operation No. 15, under "Ventilator Glass Removal from Chrome Frame after Unit is Removed from Assembly", Page 24.

Adjustments

17. Excessive or insufficient play for easy operation of handle is controlled by adjustment screw (item 10, Fig. 24). Turn screw in to increase tension.
18. Excessive play in the glass frame may develop due to looseness of glass frame shaft in the box connection of the control unit.
19. Remove control unit if adjustment screw, holding ventilator frame shaft to ventilator control unit, is not effective. With a hack saw, slot box section at each end (Fig. 24-B). This will allow the box section of the control unit to fit snugly to both sides of the glass frame shaft when tightening the frame shaft to control screw (item 7, Fig. 24).

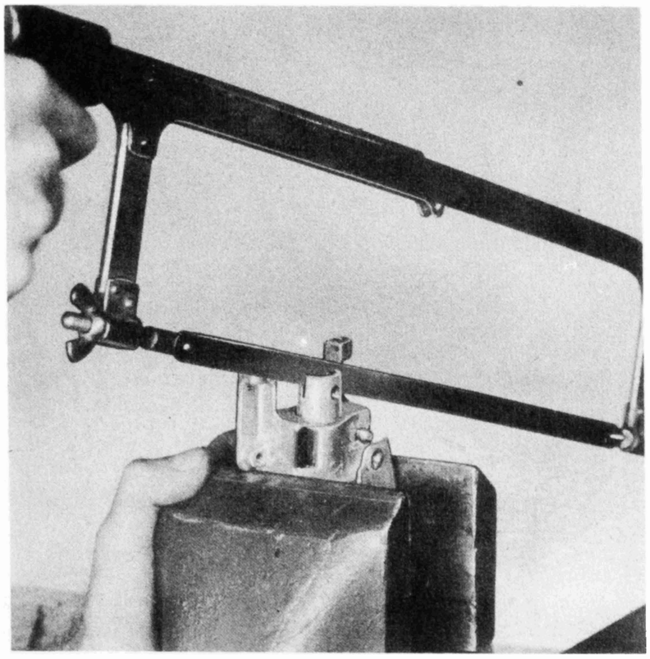


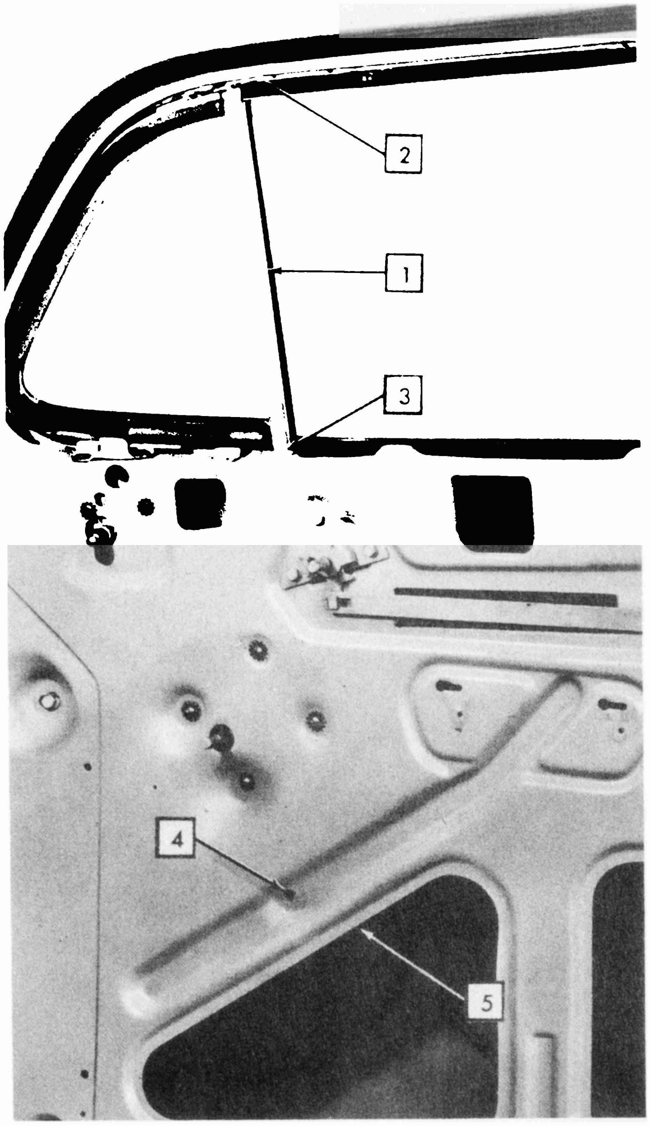
Figure 24-B—Sawing Slot in Ventilator Control Shaft Socket for Tightening Shaft.

20. Correct the opening between glass frame and ventilator channel by inserting flat washers between ventilator channel brackets and door. As there are five brackets, shim under bracket closest to opening.
21. To straighten ventilator unit in door, remove screws holding channel to door, loosen screws holding control to door, and shift complete unit as necessary. Tighten all screws.

25. VENTILATOR CENTER GLASS CHANNEL—FRONT DOORS

1949 "600" and "Ambassador 6" Series

The ventilator glass, when closed, bears against a rubber seal. This rubber seal also serves as a glass channel for the front edge of the door glass.

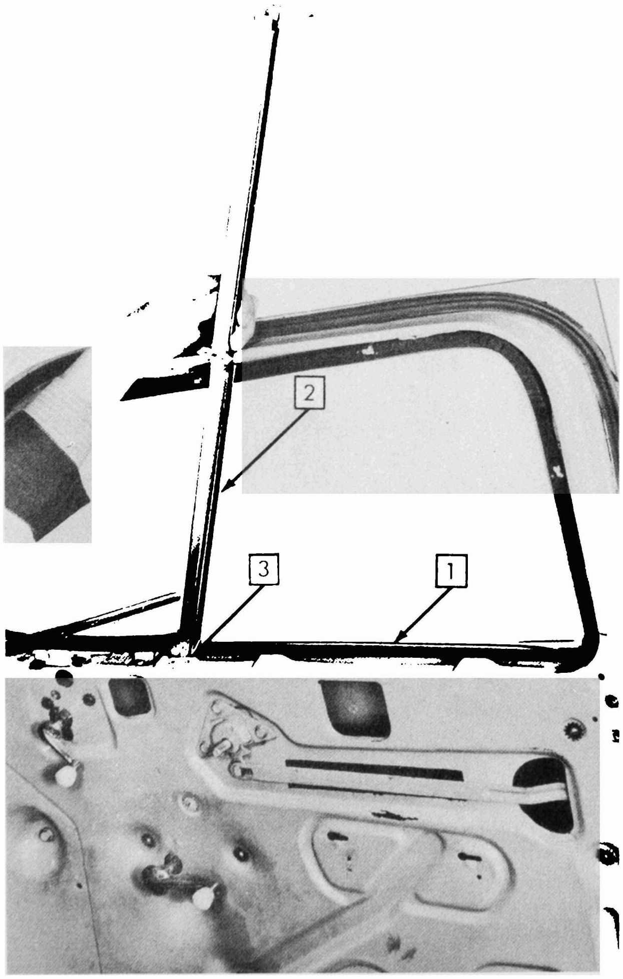


1. Ventilator center glass channel assembly
2. Channel screws to door header
3. Channel screws to top of door inner panel
4. Adjustable nut
5. Adjustable support stud (inside door)

Figure 25—Ventilator Center Glass Channel Assembly—Front Doors.

Removal Procedure

1. Remove finish molding (Subject 14).
2. Remove remote control and window regulator handle (Subject 15).
3. Remove front door ventilator handle (Subject 16).
4. Remove front door arm rest (Subject 17).
5. Remove door trim panel (Subject 18).
6. Remove screws holding glass center channel to door header and screws holding glass channel to top of door inner panel, also glass center channel support stud and adjusting nut. Lift glass center channel from door (Figs. 25 and 25-A).

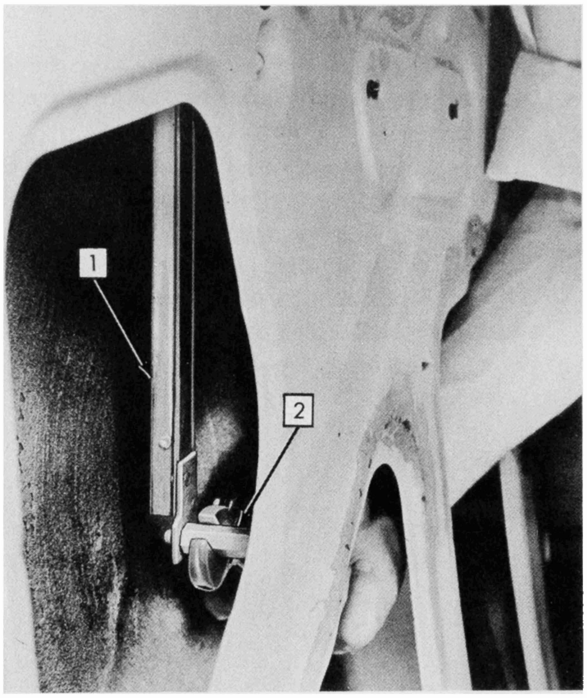


1. Door glass in lowered position
2. Channel in raised position
3. Bottom of channel between ventilator rubber and door glass

Figure 25-A—Removing Ventilator Center Glass Channel Assembly.

Adjustment

7. Adjust center channel support stud in or out at bottom so that glass will travel straight up and down in channel and not bind on either side (item 5, Fig. 25).
8. An elongated hole is provided in the door inner panel whereby this channel may be adjusted against the edge of the glass and the lock nut tightened to hold the adjustment selected (Fig. 25-B).



1. Ventilator glass channel at the bottom
2. Support stud

Figure 25-B—Removing, Installing, or Adjusting.

Lubrication

9. Use powdered or flake graphite in glass channel. Never use oil or wax.

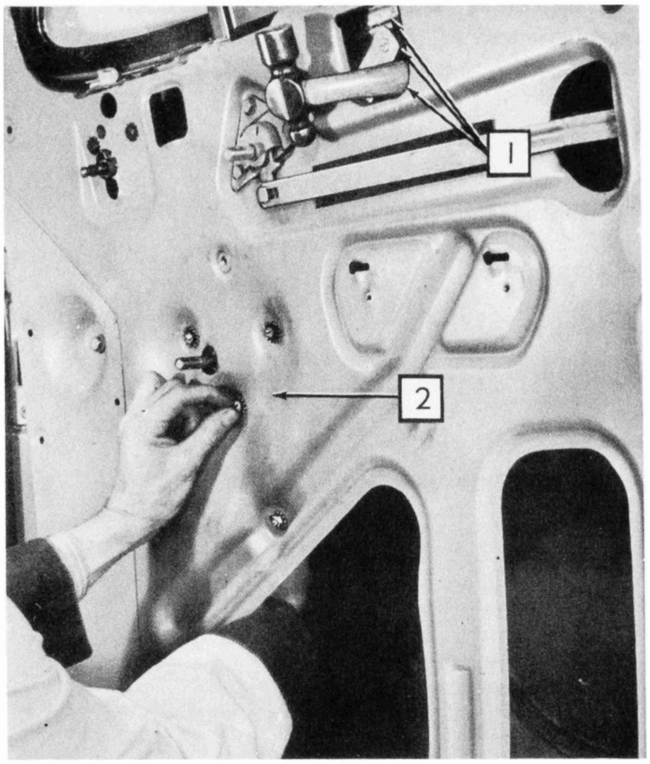
26. WINDOW REGULATOR—FRONT DOOR SEDAN

1949 "600" and "Ambassador 6" Series

Removal Procedure

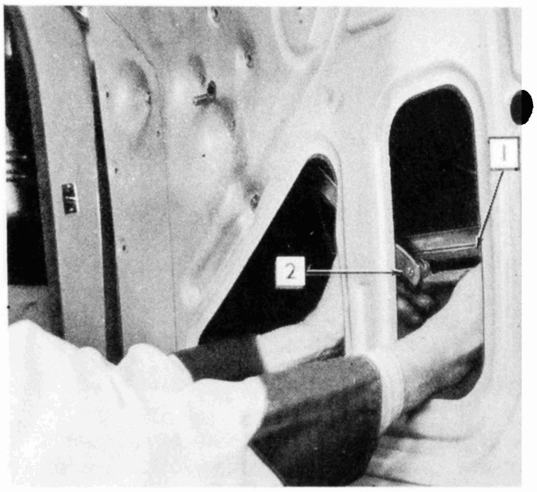
1. Remove finish molding (Subject 14).
2. Remove remote control and window regulator handles (Subject 15).
3. Remove ventilator handle (Subject 16).

4. Remove door arm rest (Subject 17).
5. Remove door trim panel.
6. Raise door glass, and wedge with hammer handle (Fig. 26).



1. Glass raised and wedged with hammer handle
2. Removing screws holding regulator to door inner panel.

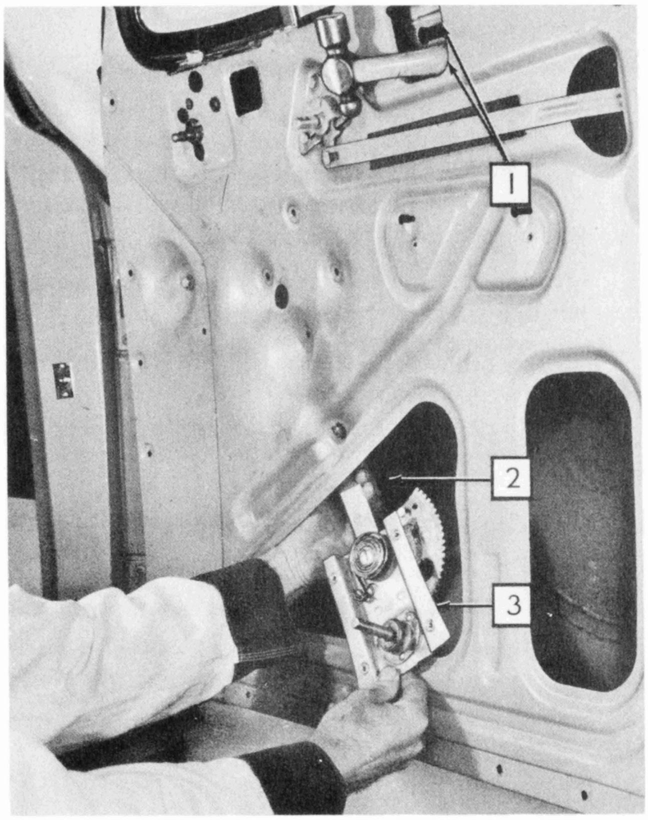
Figure 26—Removing Window Regulator—Front Door, Sedan.



1. Glass Bottom channel
2. Regulator arm

Figure 26-A—Removing Window Regulator Arm from Glass Bottom Channel—Front Door, Sedan.

7. Remove screws from regulator unit.
8. Remove wedge holding glass in raised position. Lower glass by hand, allowing regulator arm to slide in glass bottom channel.
9. Disengage regulator arm from glass bottom channel in full lowered position (Fig. 26-A).
10. Raise glass by hand and wedge with hammer handle (Fig. 26-B).
11. Guide regulator arm between door inner panel and center division bar, removing regulator through door panel opening (Fig. 26-B).



1. Glass wedged in raised position by hammer.
2. Guiding regulator arm between door panel and center division bar.
3. Removing regulator through door panel opening (with regulator arm cranked on regulator to raised position).

Figure 26-B—Removing Window Regulator from Front Door—Sedan.

27. WINDOW REGULATOR AND GLASS —BROUGHAM DOORS

1949 "600" and "Ambassador 6" Series

Window Regulator—Brougham Door

The Brougham door window regulator is fastened to the door inner panel with five screws.

The window regulator arm studs, which extend through the glass bottom channel slots, are grooved. They are held to the bottom channel by retainers as shown in SEDAN REAR DOORS, Subject 28.

These units on the Brougham doors are exposed for observation. They are easily removed to disengage the regulator arms from the glass bottom channel.

No. 1—Brougham Door Glass

Removal Procedure—No. 1

1. Remove finish molding (Subject 14).
2. Loosen door trim panel at top (by loosening top trim panel fastener on door hinge and lock pillars).
3. Raise glass until both window regulator arm studs and retainers appear at cut-outs in top of door inner panel.
4. Remove retainers from arms studs, and remove arm studs from slots in glass bottom channel, holding glass in raised position.
5. Crank window regulator lowering arms to full down position.
6. Tilt glass toward lock pillar and remove from door as shown in Figure 28-C.

No. 2—Brougham Door Window Regulator Removal

Procedure—No. 2, after Glass Removal Procedure No. 1.

1. Remove ventilator handle (Subject 16).
2. Remove window regulator and remote control handles (Subject 15).
3. Remove arm rest (Subject 17).
4. Remove door trim panel (Subject 18).
5. Crank window regulator until arms fold parallel with regulator body.
6. Remove screws holding regulator to door inner panel, and remove regulator through large opening in door inner panel.

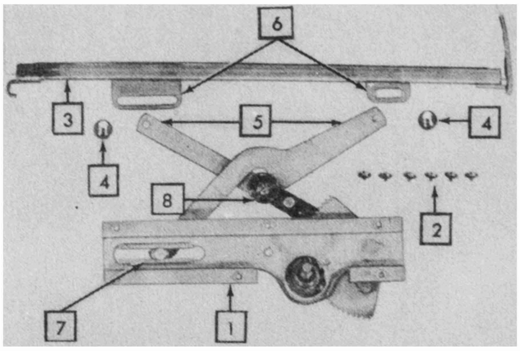
28. REAR DOOR WINDOW REGULATOR

1949 "600" and "Ambassador 6" Series

The rear door window regulator is fastened to the door inner panel with six screws.

The window regulator arm studs, which extend through the glass bottom channel slots, are grooved and are fastened to the bottom glass channel by retainers (See item 4, Fig. 28).

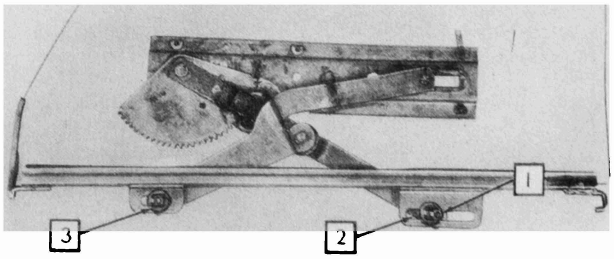
The retainers have an opening whereby they may be placed over the end of the studs, and they have a straight slot that will engage the groove in the stud with a sliding action. When the retainers have been set in the proper position, a small projection or cap in the center of the retainer locks itself over the concave end of the stud. This holds the regulator arms in the bottom channel grooves (Fig. 28).



1. Window regulator
2. Window regulator screws
3. Glass bottom channel
4. Regulator arm to bottom channel retainers
5. Regulator arm studs
6. Bottom glass channel regulator arm slots
7. Arm to regulator slot
8. Coil spring

Figure 28—Rear Door Window Regulator and Glass Assembly—in Raised Position.

Since these units are not exposed for observation it is important to know this construction before removing or replacing them.



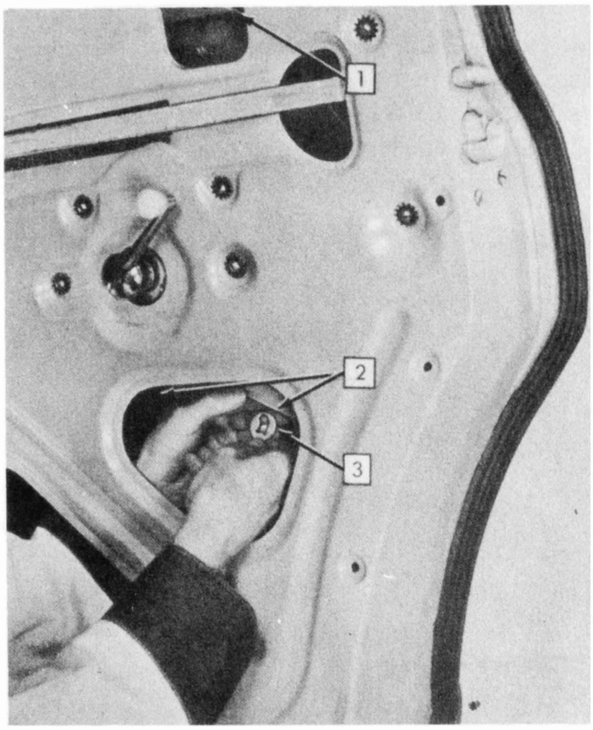
1. Window regulator arm stud in bottom channel
2. Retainer set on stud with inside slot flange of retainer started into groove of stud
3. Retainer in locked position — with cap of retainer over end of stud

Figure 28-A—Right Rear Door Window Regulator Arms Installed in Glass Bottom Channel in Lowered Position. View Looking through Door Outer Panel.

WINDOW REGULATOR ASSEMBLY

Removal Procedure

1. Remove finish molding (Subject 14).
2. Remove remote control and window regulator handles (Subject 15).
3. Remove door trim panel (Subject 18).
4. Lower glass to full down position.
5. Remove retainers from window regulator arm studs (Fig. 28-A).
6. Remove regulator arms from glass bottom channel (Fig. 28-B).



1. Glass in lowered position
2. Window regulator arms
3. Window regulator arm stud to bottom channel retainer removed

Figure 28-B—Removing Rear Door Regulator Arm Stud Retainers and Studs from Glass Bottom Channel.

7. Push glass up in slide channels to top of door, tilting toward lock pillar, and remove from door (Fig. 28-C).
8. Crank arms, with regulator handle, to folded position in line with regulator body (Fig. 28-D).
9. Remove six screws holding regulator to door inner panel.
10. Tilt regulator toward lock side of door and remove through large opening in door inner panel (Fig. 28-E).

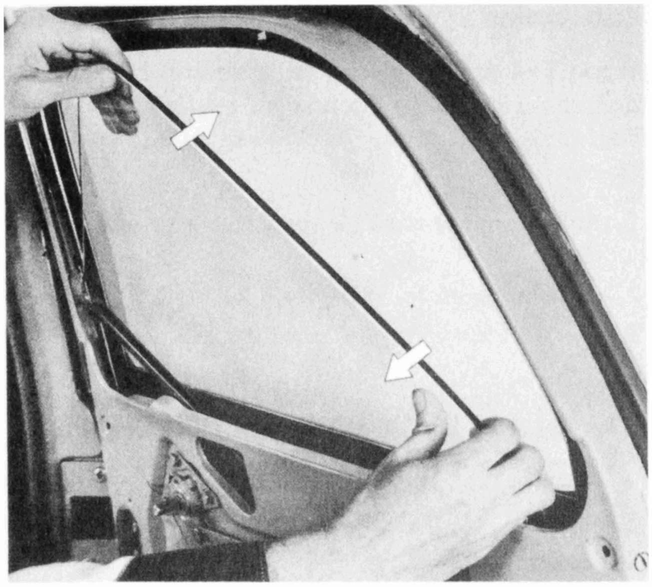


Figure 28-C—Removing Glass from Rear Door after Regulator Arms have been Removed from Bottom Channel while in Lowered Position. Glass Tilted toward Lock Post for Removal.

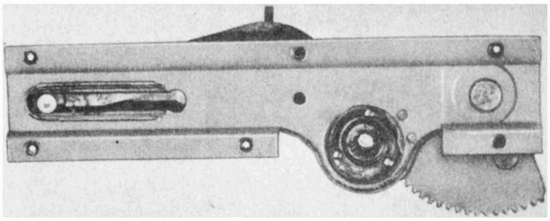


Figure 28-D—Rear Door Window Regulator with Arms folded in Line with Regulator Body.

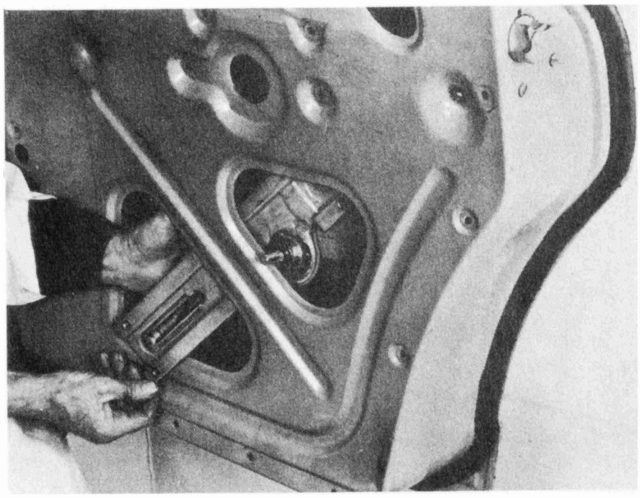


Figure 28-E—Removing Rear Door Window Regulator.

To Replace, Reverse Removal Procedure

Lubrication

Apply Lubriplate to teeth in drive and driven gears and to all points of friction on regulator. Refer to Figure 28 and apply Lubriplate to the following places:

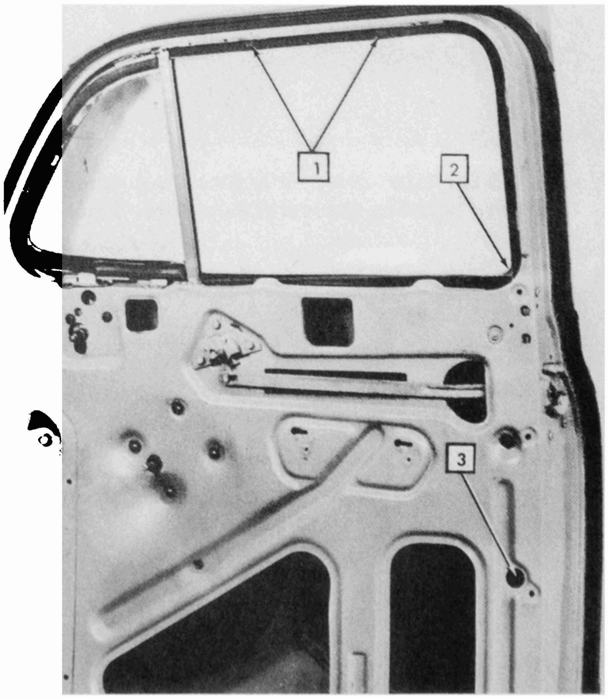
1. Bottom glass channel regulator arm slots (item 6).
2. Arm to regulator slot (item 7).
3. Regulator coil spring (item 8).

29. GLASS SLIDE AND HEADER CHANNEL —FRONT DOOR

1949 "600" and "Ambassador 6" Series

Removal Procedure

1. Remove finish molding (Subject 14).
2. Remove front door arm rest (Subject 17).
3. Loosen door trim panel along lock side and bottom of door.
4. Remove screw in channel of door, located about 2" above bottom of window opening on lock side. (item 2, Figure 29).



1. Clips—(on channel)
2. Screw channel to door
3. Screw retainer to door

Figure 29—Front Door. Glass Slide and Header Channel, Fastening Clips and Screws.

5. Remove screw holding bottom of glass channel retainer to door (item 3, Figs. 29 and 29-A).
6. With glass in lowered position, carefully pull glass channel away from top of door, releasing channel clips.
7. Remove any shims behind glass channel (Fig. 30-A).
8. Remove channel from door by raising and lowering door glass from the down position upward about 6" and steadily lifting upward on channel.

To Replace, Reverse Removal Procedure

Caution: *Before installing screw through glass channel to door, check side movement of glass in channels. If it is excessive, insert shim between channel retainer and channel as necessary for snug fit (Fig. 30-A).*

Lubrication

9. Use powdered or flake graphite in glass channels. Never use oil or wax.

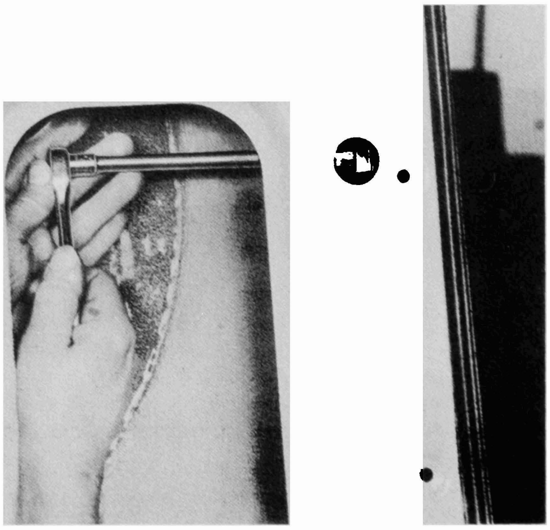


Figure 29-A—Removing or Installing Glass Channel Retainer Screw on Lock Side, All Doors; and Hinge Side, Rear Doors.

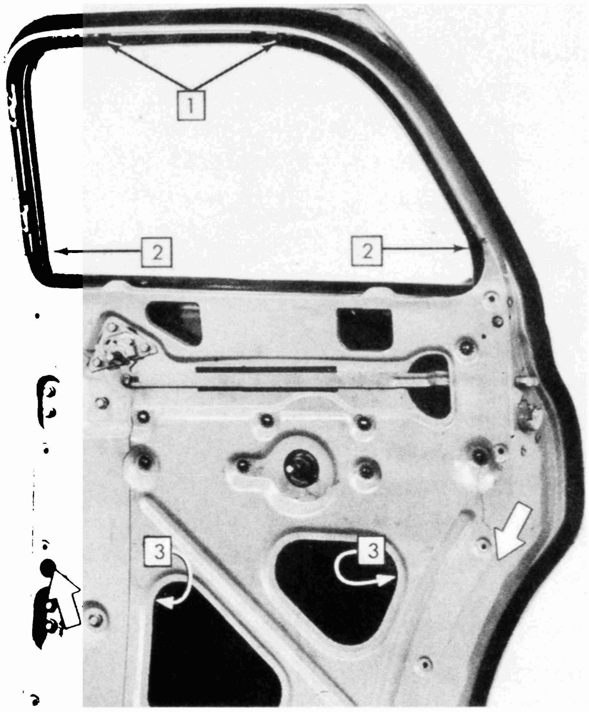
30. GLASS SLIDE AND HEADER CHANNEL —REAR DOORS

1949 "600" and "Ambassador 6" Series

Removal Procedure

1. Remove finish molding (Subject 14).
2. Loosen door trim panel along both sides and bottom.

3. Remove screws holding bottom of glass slide channel retainer on door lock and hinge posts (item 3, Fig. 30).



1. Clips
2. Channel to door screws
3. Retainer to door screws

Figure 30—Glass Slide and Header Channel Fastening Clips and Screws—Rear Door.

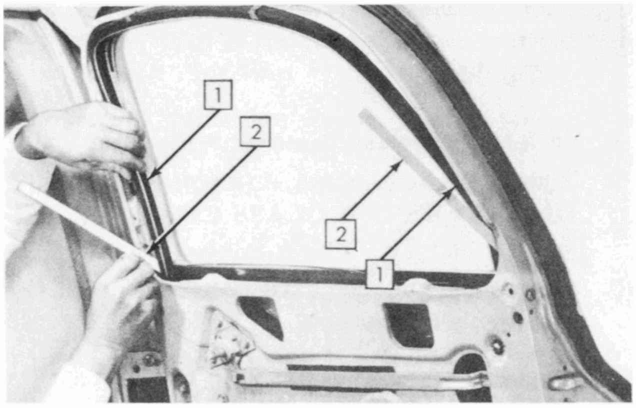
4. Remove screws, glass channel to door, located about 2" above bottom of window opening on hinge and lock posts.
5. Carefully pull glass channel from top of door, releasing channel clips from door.
6. Remove any shims behind glass channel.
7. Lift up on glass channel while raising door glass about 6" to remove channel from door.

To Replace, Reverse Removal Procedure

CAUTION: *Before installing the screws, check the side movement of the glass in the channel. If it is excessive, insert a shim between the channel and channel retainer on both sides as necessary for a snug fit (Fig. 30-A).*

Lubrication

8. Use powdered or flake graphite in glass channel. Never use oil or wax.



1. Glass channel
2. Shims

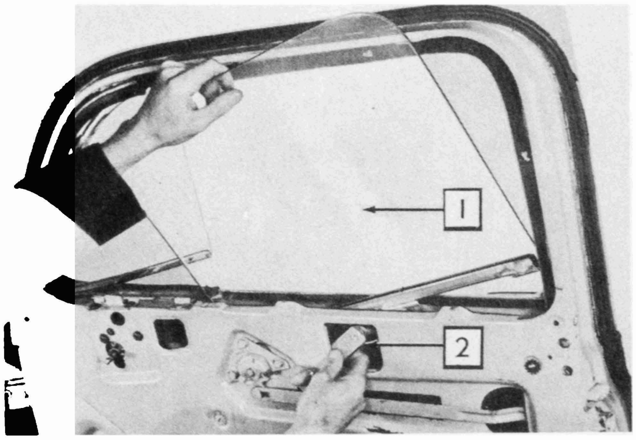
Figure 30-A—Removing or Installing Glass Slide and Header Channel and Shims.

31. DOOR GLASS—FRONT DOOR

1949 "600" and "Ambassador 6" Series

Removal Procedure

1. Remove finish molding (Subject 14).
2. Remove remote control and window regulator handles (Subject 15).
3. Remove ventilator handle (Subject 16).
4. Remove arm rest (Subject 17).
5. Remove trim panel (Subject 18).
6. Remove ventilator center glass channel (Subject 25).
7. With ventilator glass open, raise door glass, pull top to inside, and tilt front edge toward front of



1. Glass raised to full up position, top tilted away from door and toward hinge pillar
2. Window regulator arm can be removed from bottom channel

Figure 31—Removing Front Door Glass.

door, disengaging regulator arm from glass bottom channel at cut out in door panel (item 2, Fig. 31).

8. **To install, Reverse Removal Procedure**
9. When installing, check *Adjustments,* VENTILATOR CENTER GLASS CHANNEL, Subject 25, and CAUTION, Subject 29.
10. Apply Lubriplate to glass bottom channel slot and regulator arm stud.

32. DOOR GLASS—REAR DOOR

1949 "600" and "Ambassador 6" Series

Removal Procedure

Refer to Subject 28 and Figures 28, 28-A, 28-B and 28-C, Rear Door Window Regulator, and follow operations 1 through 7 inclusive. Lubricate regulator arm studs in glass bottom channel slots.

33. REAR QUARTER VENTILATOR ASSEMBLY

1949 "600" and "Ambassador 6" Series

Removal Procedure

1. Remove all visible screws in finish molding.
2. Open ventilator glass, and pull lip of channel rubber down (Fig. 33), releasing window assembly from flange of window opening. Then pull top part of assembly to inside of car and lift complete unit from window opening.

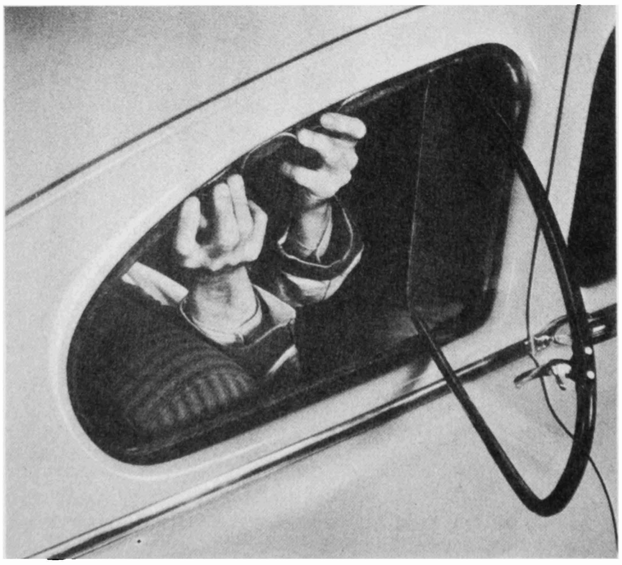
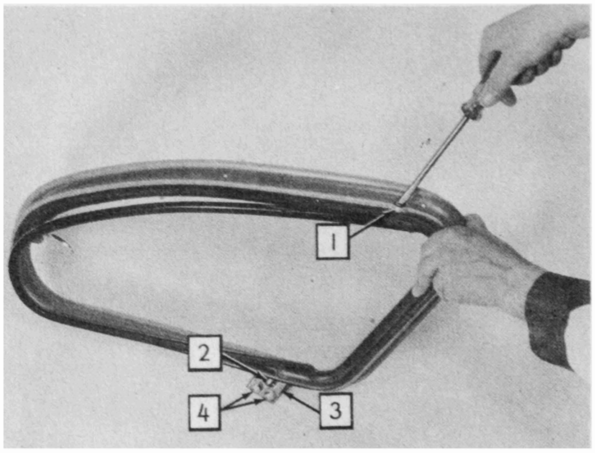


Figure 33—Removing Rear Quarter Ventilator Assembly.

To Remove Glass and Frame Assembly from Finish Molding Frame Assembly

3. Remove two bolts holding friction plate, releasing glass frame pivot (Fig. 33-A).



1. Upper pivot shoulder screw
2. Glass frame pivot
3. Friction bracket and plate
4. Bolts

Figure 33-A—Removing Glass and Frame Assembly from Finish Molding Frame Assembly.

4. Remove top pivot shoulder screw.
5. Remove glass and frame from top of finish molding assembly and lift up, disengaging lower pivot from slot in bottom of finish molding assembly.

Ventilator Glass Removal from Frame after Unit is Removed from Finish Molding Frame Assembly

6. Clamp bottom pivot in vise.
7. Spread top and bottom of glass frame slightly away from glass.
8. Take two small blocks of wood about 3" square and 1" thick. Apply one on each side of glass, inserting cork tape or strips of rubber between wood blocks and glass. Tighten a "C" clamp over blocks of wood. This will form handle to pull glass out of frame. See Figure 24-A, Subject 24, Page 24.

Ventilator Glass Removal from Frame without Removing Complete Assembly from Car

9. With ventilator in body and no other parts removed, ventilator glass may be removed by

opening ventilator as far as possible and proceeding as described in operations 7 and 8 above.

Adjustment

10. Tightening of friction bracket and plate against glass frame pivot (item 2, Fig. 33-A), should be sufficient to hold ventilator open while driving, but not enough to bind lower pivot, causing window to operate hard.

For Replacement of Complete Unit Into Window Opening

11. Tie a small cord in groove or lip of rubber weatherstrip, allowing loose ends of cord to extend out at top front corner of assembly (Fig. 33-B). When complete unit is anchored in position, pull out cord which will lift lip of rubber out and over window ledge, as shown in Figure 33-C.

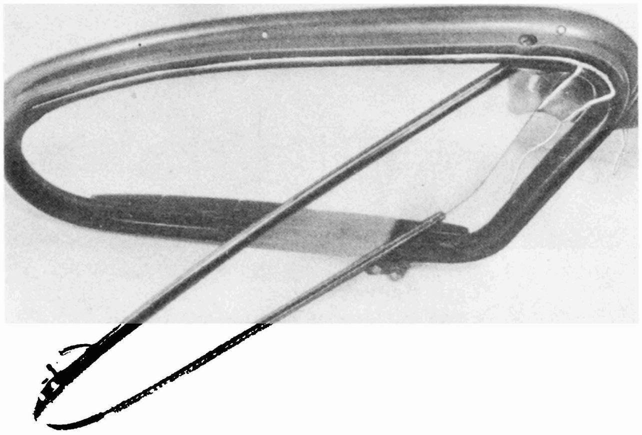


Figure 33-B—Installing Cord in Groove or Lip of Rubber Weatherstrip—Rear Quarter Ventilator.

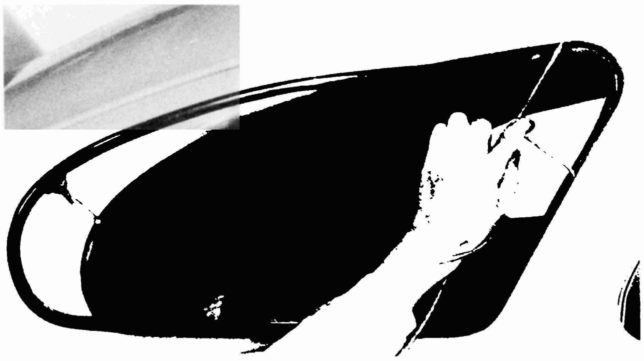


Figure 33-C—Installing Rear Quarter Ventilator Assembly Lifting Lip of Rubber Weatherstrip over Flange of Window Opening.

Adjustment of Glass and Frame Assembly in Finish Molding Frame Assembly

12. Before tightening screws that fasten unit to body, open and close window to determine if it is binding on rubber weatherstrip.

    If binding at top or bottom: Top and bottom screws should be tightened first to draw finish molding frame up and down to provide clearance.

    If binding at front or rear edge of glass or frame: Tighten screws at front and rear of finish molding frame first to provide clearance. *Do not tighten* screws excessively, as this will distort finish molding frame and cause glass frame to rub on rubber weatherstrip when opening or closing. A uniform clearance between glass frame and finish molding frame at top, bottom, front and rear must be maintained. This can be accomplished only through proper spacing of glass frame in finish molding, before tightening friction bracket to lower pivot, and through proper spacing of finish molding frame in window opening. The latter spacing is obtained by adjusting the screws holding finish molding in window opening.

Lubrication

13. When installing or servicing this assembly the lower pivot should be lubricated with Lubriplate (Fig. 33-A).

34. DOOR CHECKS AND STOPS

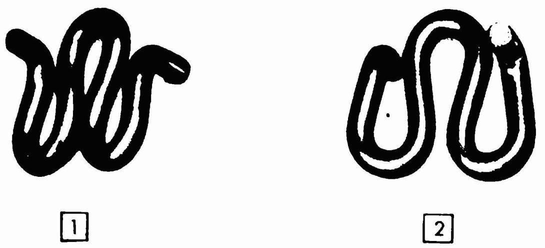
1949 "600" and "Ambassador 6" Series

All doors are provided with door checks and stops. These features are incorporated in the door hinges. "W" shaped springs are in each hinge. These serve as a door check to hold the door in the full open position and to assist in closing the door after they are released from the open position setting (Fig. 34).

Door stops are built into the hinges. They are set to a relatively safe position: They allow the door to open sufficiently, yet prohibit it from opening so far that it would contact the body and cause damage to the door or body panels.

The door checks or hinge springs are replaceable. Refer to Subjects 35 and 36.

The door stop is a part of the hinge which requires no attention except in cases of damage when the door is forced open too far. In these cases, the hinge should be replaced.



1. Hinge spring—left (1 used in each hinge of right front and rear doors, sedans)
2. Hinge spring—right (1 used in each hinge of left front and rear doors, sedans)

Figure 34—Door Hinge Springs.

Hinge springs can be replaced *only by removing the hinge pin. Therefore the hinge must be removed from the body pillar.*

It is not necessary to remove the hinge from the door, as the complete door with hinges can be removed from the body by removing the screws holding hinges to body pillars.

Broughams or Two-Door Models

The upper hinge has two springs.

Right Doors

1 — Right spring in top of upper hinge.
1 — Left spring in bottom of upper hinge.

Left Doors

1 — Left spring in top of upper hinge.
1 — Right spring in bottom of upper hinge.

The lower hinge has only one spring.

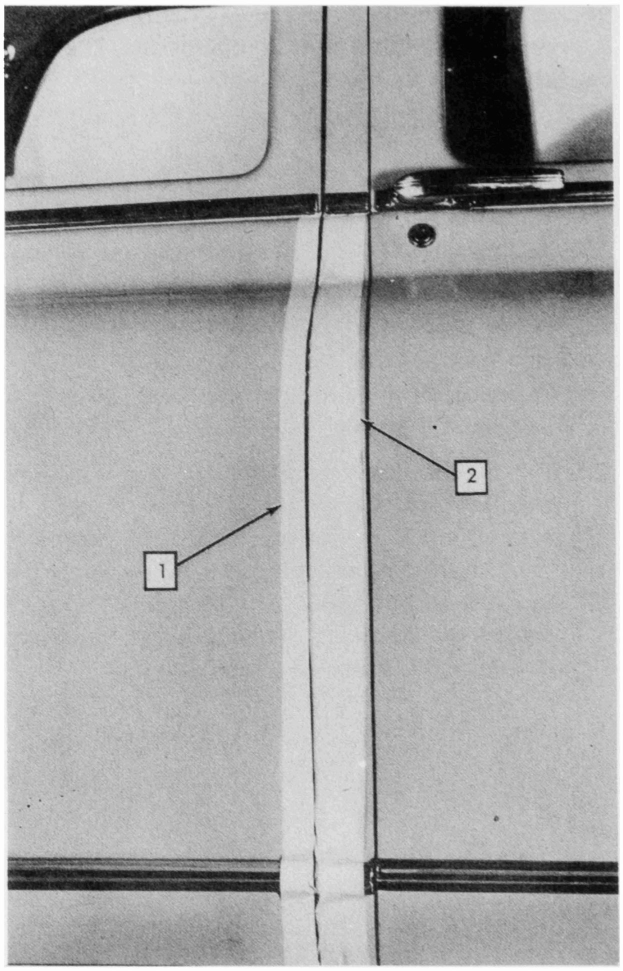
1 — Left spring in the lower hinge (right door).
1 — Right spring in lower hinge (left door).

35. DOOR HINGE SPRING INSTALLATION—REAR DOOR

1949 "600" and "Ambassador 6" Series

Removing Door from Body

1. Use 2" masking tape on door flange and body to prevent damage to paint in removing door from body, as shown in Figure 35.
2. With scratch awl, mark around both hinges on body pillar to assist in proper setting of door, and adjustment when it is re-installed as shown in Figure 35-A.



1. Tape flanges of door
2. Tape surface of body hinge pillar

Figure 35—Door and Body Hinge Pillar Taped for Door Removal.

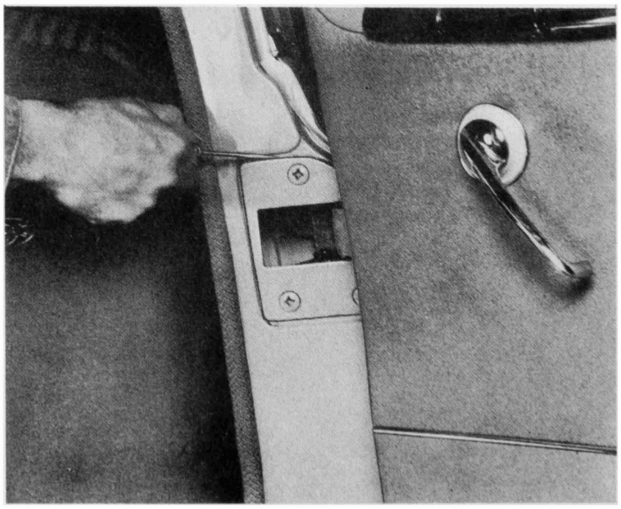
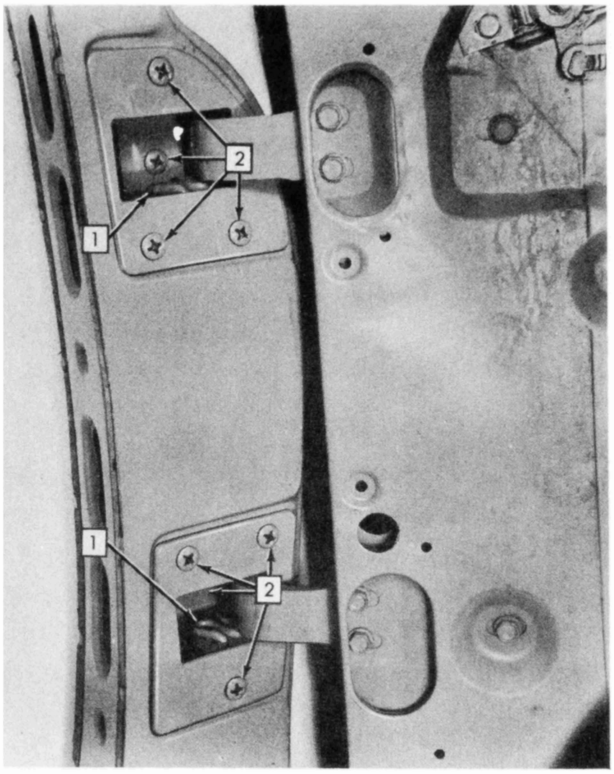


Figure 35-A—Marking Location of Hinges on Body Pillar with Scratch Awl.



1. Left spring
2. Four screws

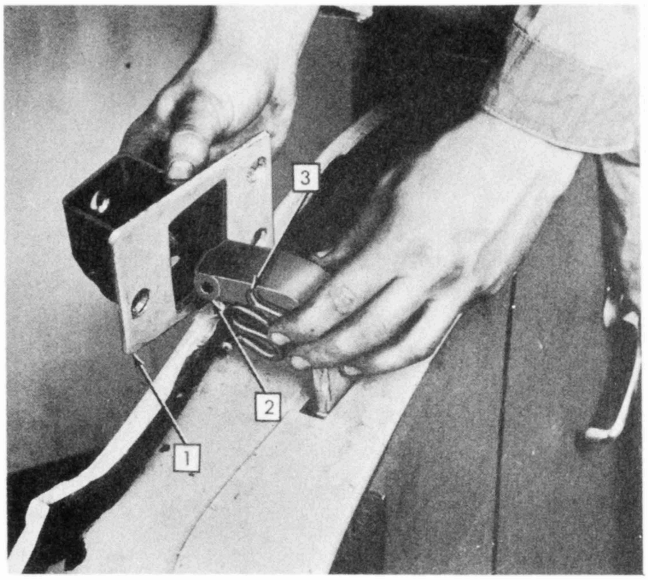
Figure 35-B—Door Hinges Screws and Springs—Right Rear Door.

3. Observe type of screw used in hinges—Phillips or Reed & Prince head (Fig. 35-B). Use proper screw driver. Remove all screws from both hinges to body pillar.
4. Lift door and carefully remove door hinges from body hinge pillar.
5. Place a suitable cover or pad on floor and against bench so that lock side of door may rest on pad and lean against bench without damaging door or paint.
6. Close hinge and carefully remove hinge pin. See CAUTION, Step No. 14.
7. Remove hinge base from shaft.

To Assemble Hinge and Spring See Subject 34 and Obtain the Correct Spring.

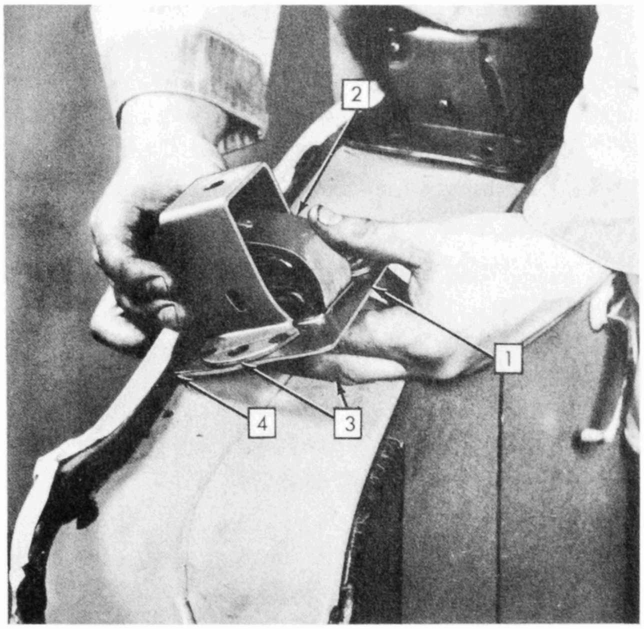
NOTE: *If there is a burr on end of spring prong, grind it off before installing.*

8. Insert spring prong in hinge shaft, and place hinge base over end of shaft as shown in Figure 35-C.
9. Hold top side of hinge base against shaft, tilting bottom side of hinge base up while placing spring prong against hinge base in line with slot which it is to engage. Wedge front edge of hinge face plate against door sealer rubber as shown in Figure 35-D.



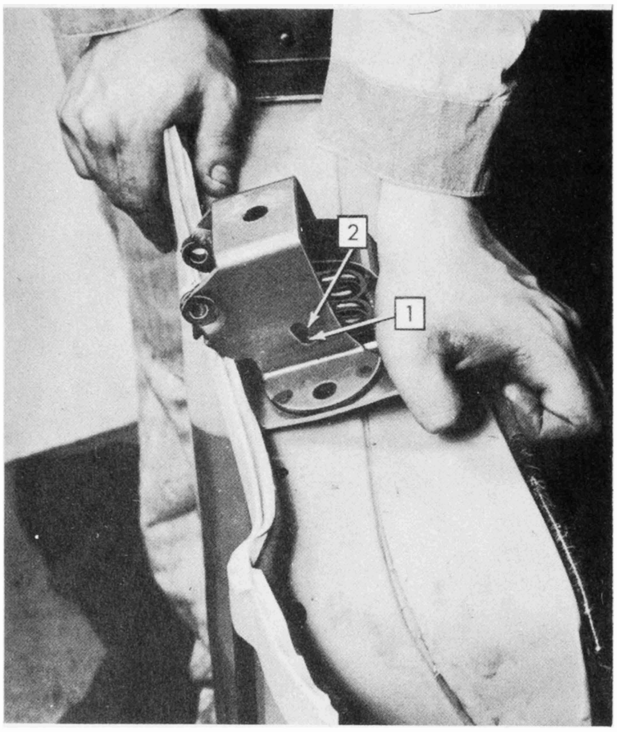
1. Hinge base
2. Hinge shaft
3. Hinge spring with prong in hinge shaft

Figure 35-C—Installing Hinge Base on Shaft with Spring in Proper Position.



1. Holding hinge base against hinge shaft
2. Hinge shaft
3. Tilting bottom side of hinge base up while placing spring prong in alignment with slot in hinge base
4. Hinge face plate wedged against door sealer rubber

Figure 35-D—Aligning Hinge Base on Shaft so Spring Prong will Enter Slot in Hinge Base.



1. Spring prong
2. Slot in hinge base

Figure 35-E—Closing Hinge so Spring Prong will Engage Slot in Hinge Base.

10. Following alignment (Operation 9), close hinge, forcing spring prong into slot of hinge base as shown in Figure 35-E.
11. With hinge closed, apply Lubriplate to hinge pin and install in hinge. (See CAUTION)
12. Open hinges and install door to body.
13. Align door so hinges will conform with scratch awl marks on body pillar, and tighten screws.

CAUTION: *When removing or installing hinge pins place heavy hammer against hinge while driving pin in or out. This will eliminate moving the hinge adjustment to the door pillar and inner panel.*

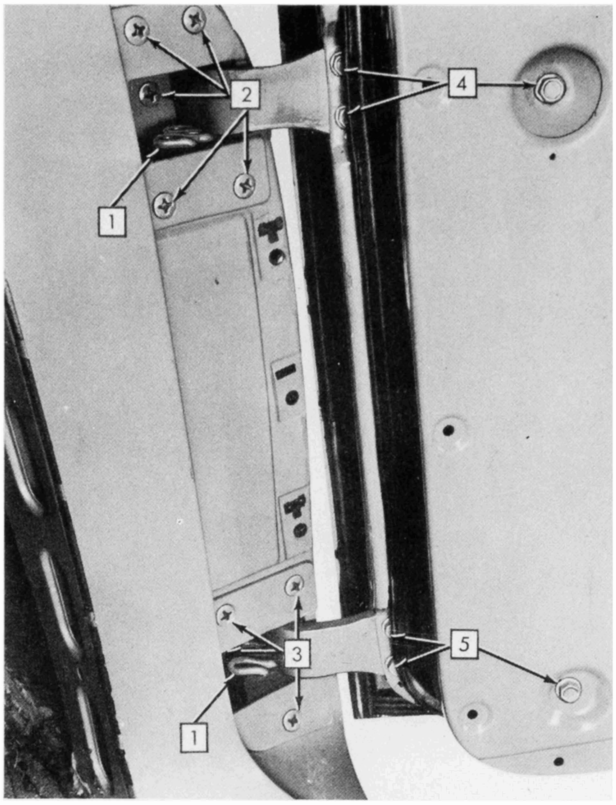
Lubrication

14. Apply Lubriplate to contact points of hinge spring against hinge base and shaft.

36. DOOR HINGE SPRING INSTALLATION—FRONT DOORS—SEDANS

1949 "600" and "Ambassador 6" Series

The installation of front door hinge springs is the same as for the rear doors. See Subject 35 and follow all operations.



1. Left spring (one used in each right door hinge)
2. Five screws upper hinge to body pillar
3. Four screws lower hinge to body pillar
4. Upper hinge screw to door
5. Lower hinge screw to door

Figure 36—Door Hinge Springs—Right Front Door, Sedans.

38. DOOR ALIGNMENT—ALL MODELS

1949 "600" and "Ambassador 6" Series

The proper alignment of the door is determined and maintained by the setting and adjustment of the door hinges. The contour of the door hinge pillar is the exact duplicate of the contour of the body hinge pillar. The correct setting of door hinges on both the door and the body hinge posts should provide a uniform clearance from top to bottom along the hinge pillar. With this established, the top, bottom and lock side of the door should also provide a uniform clearance in relation to the main roof rail, floor sill and lock pillar of the body (Figure 38).

39. DOOR HINGES

1949 "600" and "Ambassador 6" Series

All the door hinges are of the pin type. These hinge pins are spiral grooved to retain lubricant and eliminate excessive wear.

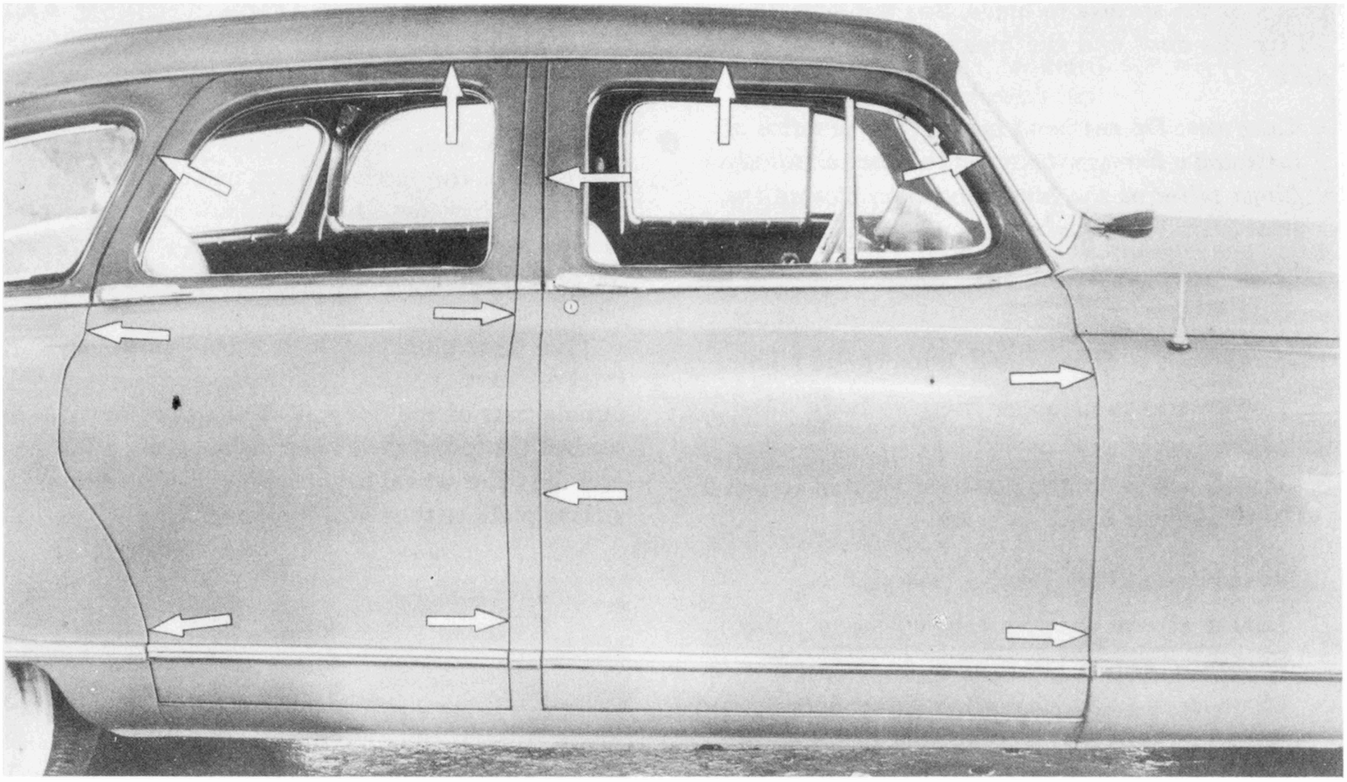


Figure 38—Door Alignment—Uniform Clearance Between Doors and Body.

The doors are also provided with "W" shaped springs which serve as door checks. These springs can be replaced in the hinges, eliminating the replacement of the complete hinge when only the spring is required. See Subjects 34, 35 and 36.

All hinges are adjustable to both the body and the door. The body hinge posts have tapped movable plates that are encased in the pillar. This permits movement of the hinge, up or down and in or out (Figs. 36 and 39).

The door pillar, inner panel and reinforcement have elongated holes, for adjustment of the door on the hinges. The door can be moved forward or back on the hinges to provide uniform clearance between the body hinge pillar and lock pillar.

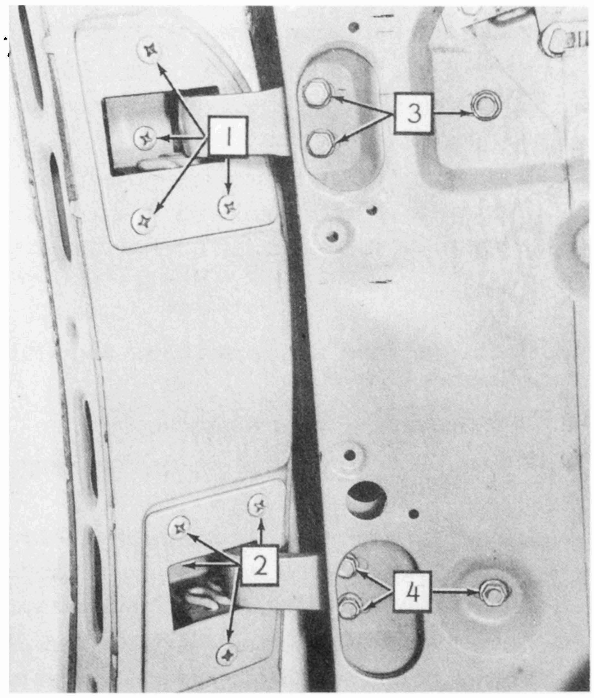
Maintenance

Keep all hinge screws tight on the door and body. Two types of screws are used in door hinges, either Phillips or Reed & Prince type.

> Caution: *Use the proper screw driver to eliminate damage to the screw heads and to insure proper tightening.*

Lubrication

Apply Lubriplate to the hinge pins and the contact



1. Upper hinge screws to body
2. Lower hinge screws to body
3. Upper hinge screws to door
4. Lower hinge screws to door

Figure 39—Rear Door Hinges Adjustable to Door and Body.

points of the springs to hinge. See Subjects 35 and 36 for the door and the hinge pin removal procedure.

> CAUTION: *Do not bend hinges. The practice of inserting a hammer between the door and body hinge pillar at the hinge and then closing the door should be discontinued.*

Adjustments

To Raise Front or Rear Door at Body Hinge Pillar:

1. Loosen screws at upper hinge to body pillar.
2. Loosen screws at lower hinge to body pillar.
3. Raise door to desired position. Tighten screws in both hinges. (See note below.)

To Move Front or Rear Door in Toward Body:

1. Loosen screws at upper hinge to body pillar.
2. Loosen screws at lower hinge to body pillar.
3. Move door in to desired position and tighten screws in both hinges. (See note below.)

To Move Front Door Closer to Center Body Pillar or Front Body Pillar:

1. Loosen front door trim panel along door hinge pillar and bottom of door.
2. Loosen screws at top hinge to door. Move top of door toward center body pillar or hinge pillar as desired, and tighten screws.
3. Loosen screws at bottom hinge to door. Move bottom of door toward center body pillar or hinge pillar as desired, and tighten screws. (See Note.)

To Move Rear Door Closer to Center Body Pillar or Rear Quarter Body Pillar:

1. Remove remote control handle.
2. Loosen door trim panel along door hinge post and bottom of door.
3. Loosen screws at top hinge to door. Move top of door toward center body pillar or rear quarter body pillar as desired, and tighten screws.
4. Loosen screws at bottom hinge to door. Move bottom of door toward center body pillar or rear quarter body pillar as desired, and tighten screws. (See Note.)

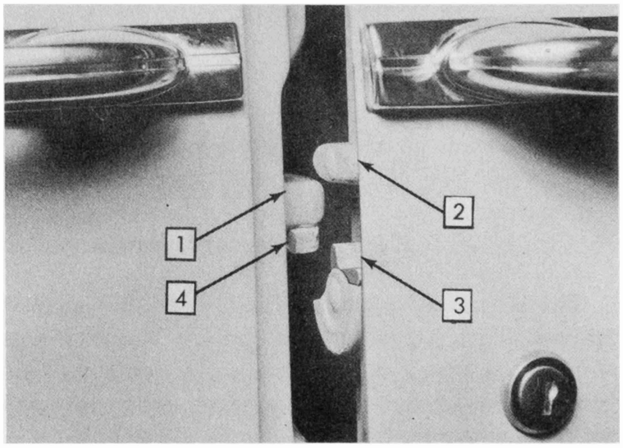
> NOTE: *After making any adjustments on hinges, refer to* Subject 40, "COMBINATION LOCK STRIKER AND MALE DOVETAIL."

40. COMBINATION LOCK STRIKER AND MALE DOVETAIL

1949 "600" and "Ambassador 6" Series

The striker plate serves a dual purpose. It keeps the door in the latched position and prevents the door from moving up and down. This striker plate also contains a pivoted safety catch which prevents the door from opening when it has not been securely closed.

The upper block and rotor wheel on the door are integral parts of the door lock, and serve as the female part of the dovetail. The upper block bears against the top of the striker plate on the pillar post, and the rotor wheel bears against the bottom of the striker plate as shown in Figure 40.



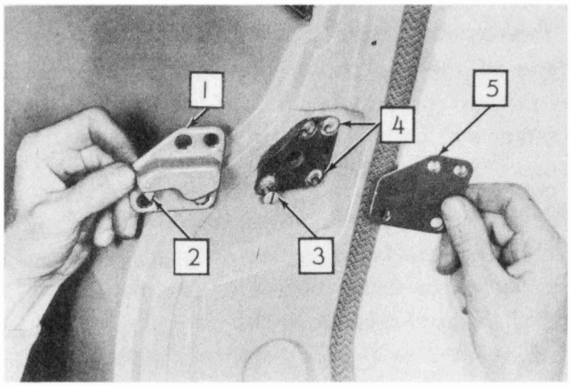
1. Striker plate and dovetail
2. Female dovetail
3. Rotor wheel
4. Safety catch

Figure 40—Door Lock Striker and Dovetail.

The rotor wheel keeps the door in the closed position, as it can turn in one direction only due to spring tension on the individual cams. This wedges the cams against the rotor wheel. When the door handles are moved to open the door, the cams in the latch release the rotor wheel so it will turn in either direction. The cams in the latch, being under individual spring tension, automatically take up clearance created by compression of the door sealer rubber. See Figures 22 and 23, Pages 20 and 22. Therefore, adjustment of the striker plate is not required as frequently as in other types of door locks.

Adjustment of Striker Plate

1. The body pillars are provided with a tapped movable lock plate that is encased in the pillar,



1. Striker plate and dovetail assembly
2. Safety catch
3. Striker plate screw
4. Striker—adjustable lock plate
5. Striker shim

Figure 40-A—Adjustment of Striker Plate.

which permits movement of the striker plate up or down, in or out (Fig. 40-A).

2. The striker plate should be adjusted so that the top will be about 1/32″ below the bottom of the dovetail block. At this setting the rotor wheel should strike the safety catch in the center when the door is being closed. The lock striker must be set low enough so that the movable catch will contact the lock rotor, causing it to revolve when the door is being opened. THIS WILL ELIMINATE THE ROTOR FROM BECOMING STUCK ON DEAD CENTER, AND ALLOW THE LOCK TO CATCH WHEN THE DOOR IS CLOSED.
3. The striker plate should be moved toward the inside of the body as far as possible and still permit latching the door without excessive pressure or slamming. This will compress the door sealer rubber sufficiently to eliminate any door noise or movement in the door and also to create sufficient sealing to prevent drafts or wind noise. In cases where the striker plate has been moved in as far as possible and the door sealer rubber is not tight against the body, it is then necessary to remove the striker plate and ream the inner edge of the holes in the body pillar.
4. The lock striker and dovetail should also extend far enough from the body pillar to permit at least 50% bearing surface for the female dovetail of the lock. To obtain this setting, shim back of the lock striker. If necessary, longer screws may be used.

CAUTION: *Never hit or try to bend either of these units to bring them into proper alignment. If either the rotor wheel or dovetail block of the lock is damaged, the entire lock assembly should be replaced.*

Lubrication

Lubricate both sides of the striker and rotor with a thin film of Lubriplate. Refer to Subject 22, Figure 22-C, DOOR LOCK LUBRICATION, Page 22.

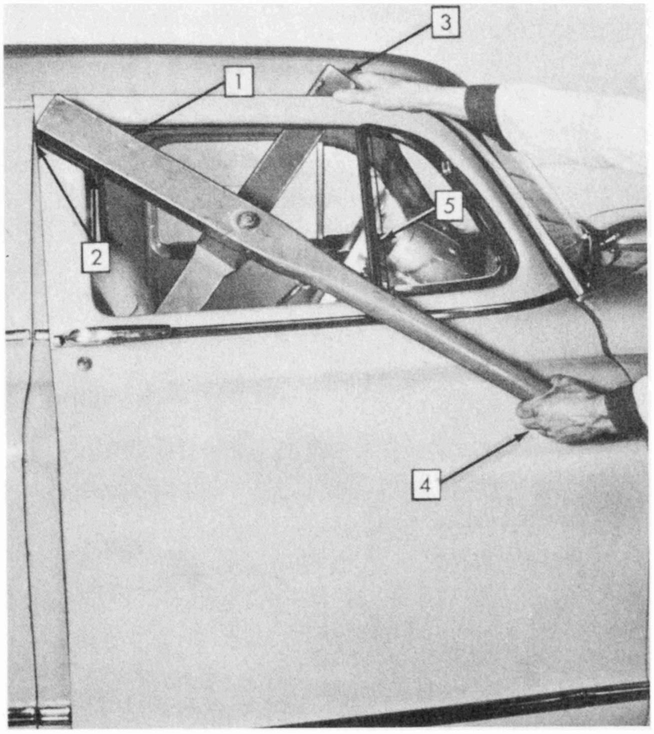
NOTE: *Always lower door glass when adjusting lock strikers. This will prevent the body from being air bound.*

In winter be sure door sealer rubbers are soft before adjusting lock striker. See Subject 42.

41. BENDING DOORS

1949 "600" and "Ambassador 6" Series

In cases where a door has been adjusted at the hinges as explained in Subjects 38 and 39, and still is not flush with the body, it can be aligned by bending the door with a door bending tool as shown in Figures 41, 41-A, 41-B and 41-C.



1. Tool placed on door pillar and not on flange
2. Rubber pad for protection of paint
3. Holding tool in proper position
4. Applying pressure on door by pulling handle out
5. Ventilator glass open ½ inch

Figure 41—Bending Top of Front Door in at Lock Side.

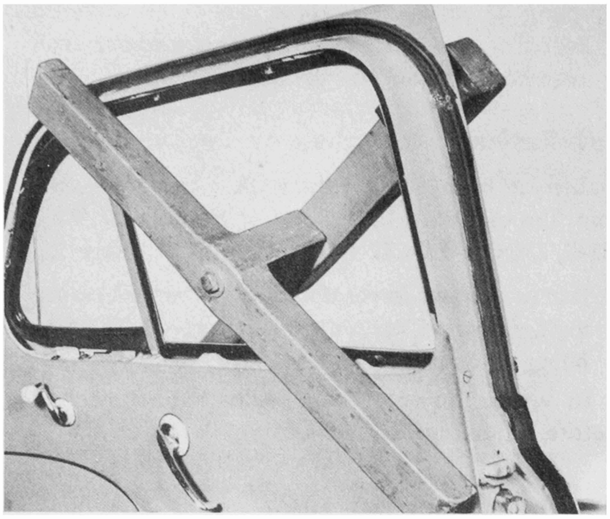
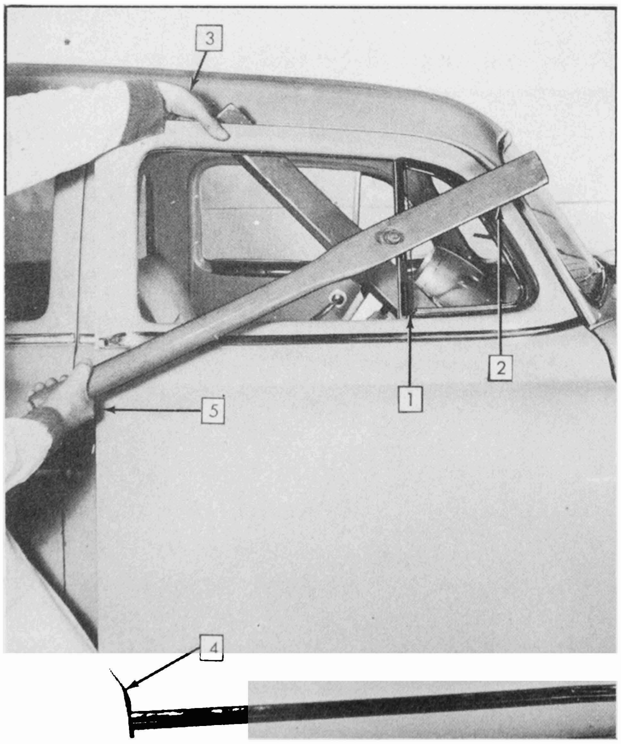


Figure 41-A—Position of Tool on Inside of Front Door.

NOTE: *Always remove the finish molding from the doors and open the ventilator glass about ½ inch, when using the door bending tool.*



1. Ventilator glass open ½ inch
2. Rubber block on door hinge post (not flange)
3. Holding tool in proper position
4. Supporting bottom of door with knee
5. Applying pressure to door by pulling handle out

Figure 41-B—Bending Top of Front Door in at Hinge Side.

CAUTION: *Care should be exercised in applying the tool to the door. See that the contacting surface of the tool is on the door pillar and does not extend too far to the outer edge, as the latter will cause the door flange to be bent, instead of the door frame.*

Pressure should be applied to the tool moderately, to avoid bending the door excessively. It is better to bend the door a little, then remove the tool and close the door for inspection. Repeat this bending operation until the door is properly aligned.

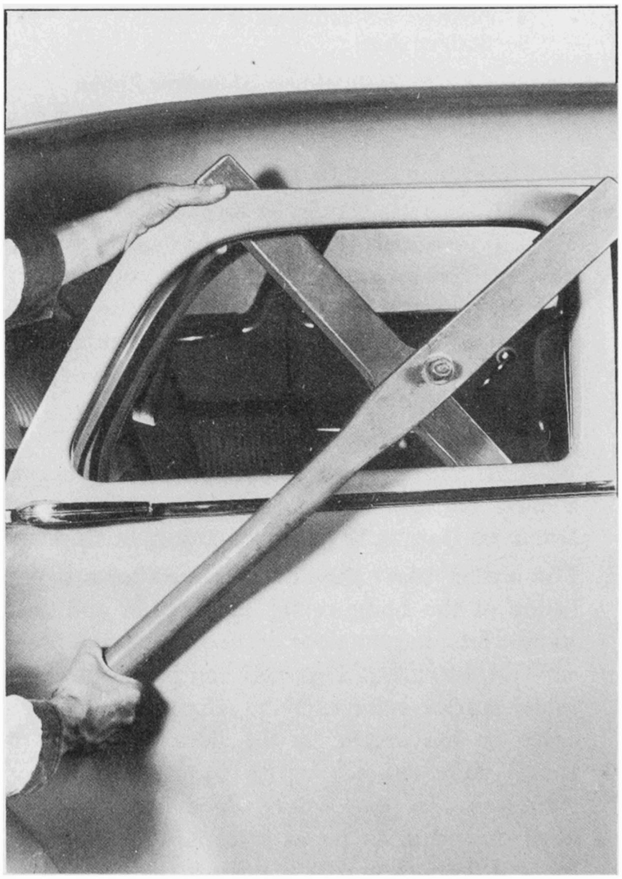


Figure 41-C—Bending Top of Rear Door in at Hinge Side.

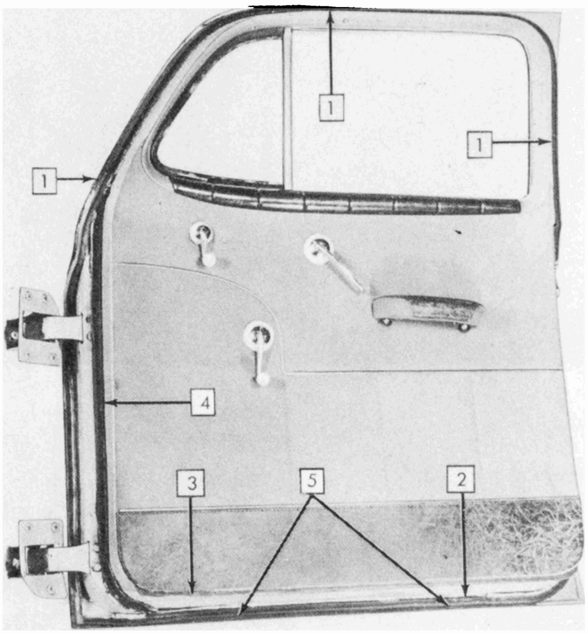
This type of door bending tool is simple in design and *very easy to make*. It has a rubber block on the exterior contacting surface to prevent damage to the paint when applied.

In cases where the door has to be bent out, the tool is applied to the inside of the door. To bend it out, the contacting surfaces of the tool should be carefully padded to avoid damage to the paint.

42. DOOR SEALER RUBBERS

1949 "600" and "Ambassador 6" Series

All of the door sealer rubbers, except the bottom inner sealer rubber on the trim panel, are of a sponge rubber with a skin over the complete exterior (Figs. 42 and 42-A). Their purpose is to seal around the door at all points of contact with the body. These sealer rubbers are cemented to the door flanges with rubber cement.



1. Sealer rubber—top and sides
2. Sealer rubber—bottom, outer (on door)
3. Sealer rubber—bottom, inner (on trim panel)
4. Sealer rubber—hinge pillar, inner
5. Drain holes in bottom of door

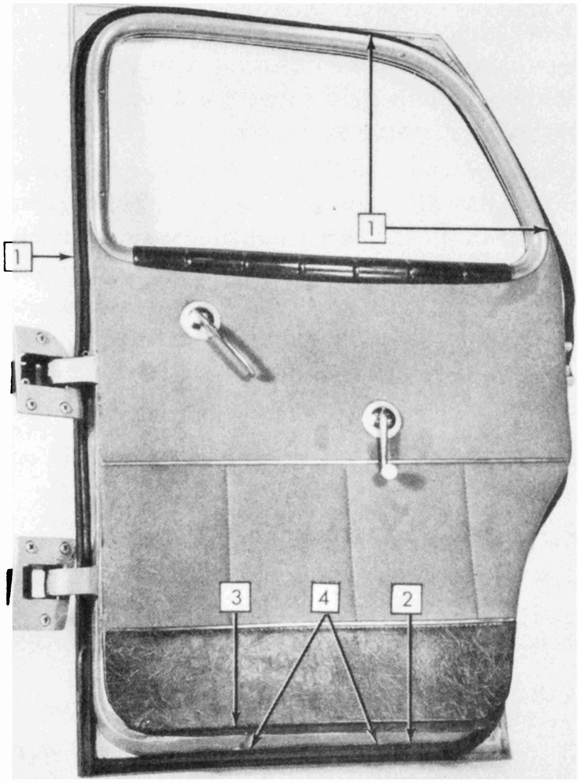
Figure 42—Door Sealer Rubbers, Right Front Door.

Should it become necessary to replace any of the door sealer rubbers, follow the replacement installation procedure below.

Replacement Installation Procedure

Replacement door sealer rubbers are coated with graphite or powder to prevent stickiness while being carried in parts stock.

1. Remove all graphite or powder with a cloth dampened in gasoline.
2. Remove all old rubber from door and clean thoroughly. Then apply a thin coat of Nash black rubber cement to the door flange.



1. Sealer rubber—top and sides
2. Sealer rubber—bottom, outer (on door)
3. Sealer rubber—bottom, inner (on trim panel)
4. Drain holes in bottom of door

Figure 42-A—Door Sealer Rubbers—Right Rear Door.

3. Apply thin coat of black rubber cement to sealer rubber on both sides which contact door flange and body pillar. Allow cement to dry to "tacky" condition before installing rubber seal onto door flange.

   CAUTION: *Insert sealer rubber between hinge and door flange until edge of rubber is even with bottom of door.*

   Do not stretch rubber.

   Do not allow any slack in rubber

   Hold sealer rubber in proper position before any contact is made with door; otherwise it will be difficult to remove rubber for readjustment.

4. Install door outer bottom sealer rubber in same manner as top and sides.

   NOTE: *When installing the outer bottom sealer rubber, see that the cutouts in the rubber line up with the drain holes in the bottom of the doors.*

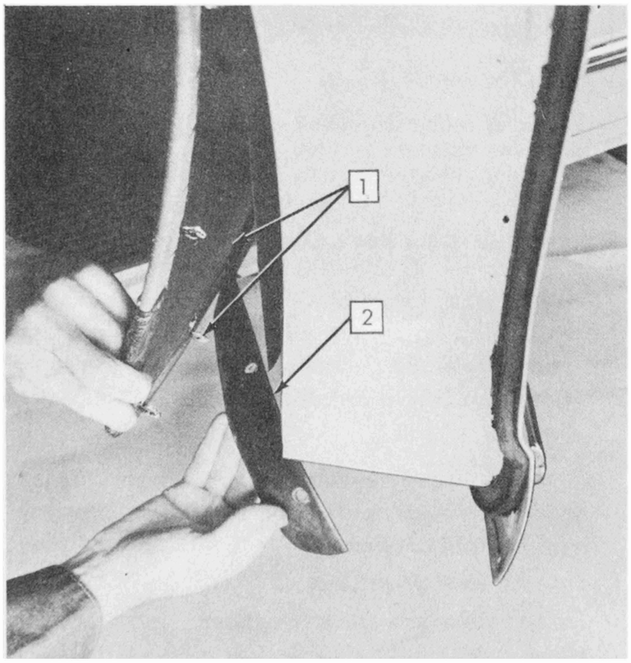
Maintenance of Sealer Rubbers

Cold weather has a tendency to cause the door sealer rubber to harden, causing it to lose some of its resiliency. This may cause the door to be loose in the opening, resulting in noise.

In service, use a cloth dampened in gasoline and clean all the dirt from the sealer rubbers on the doors. Clean all the dirt from the body pillars and from all the points where the rubber contacts the body. Now apply a good rubber softener solution to the sealing rubber. In some cases, when rubber is dry, a second application of rubber softener may be necessary to obtain desired results.

CAUTION: *Do not use graphite, brake fluid or any wax on sealer rubbers.*

The inner bottom door sealer rubber (on the trim panel) serves as an additional seal between the bottom of the door and the top of the door sill mat (Fig. 42-B). It is held in place by the door trim panel bottom clips.



1. Door trim panel and clip
2. Door sealer rubber inner

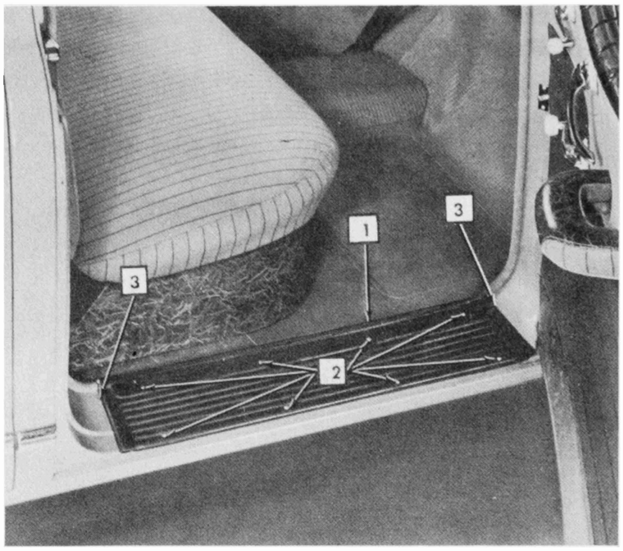
Figure 42-B—Removing or Installing Door Sealer Rubber Bottom Inner (on Trim Panel).

This seal rubber may be adjusted by elongating the holes in the rubber and moving it up or down as desired, before the clips are pressed firmly into the door inner metal panel.

43. DOOR SILL MAT

1949 "600" and "Ambassador 6" Series

The door sill mats are molded rubber with steel reinforcing and corrugations (Fig. 43).



1. Door sill mat
2. Door sill mat screws
3. Drive nails

Figure 43—Right Front Door Sill Mat and Screws, Sedan.

These door sill mats are fastened to the body sill by treated sheet metal screws. There is also one tack at each inside corner, set into the floor carpet tacking strip. These mats serve as a step plate and seal for the door inner bottom sealer rubber (Fig. 42-B).

44. BODY MOLDINGS, FASTENING CLIPS AND BOLTS

1949 "600" and "Ambassador 6" Series

Moldings are fastened to the body with various types of retainers, which are shown in the following figures.

The rear deck cover molding retainers (Fig. 44) are riveted to the flange of the cover to provide uniform appearance and seating of the cover against the sealer rubber.

The rear quarter belt molding clips are screwed to the body, and have rubber sealer washers covering the screws on the inside. This rubber sealer washer prevents water leakage and possible damage to trim panels in the trunk compartment (Fig. 44-A).

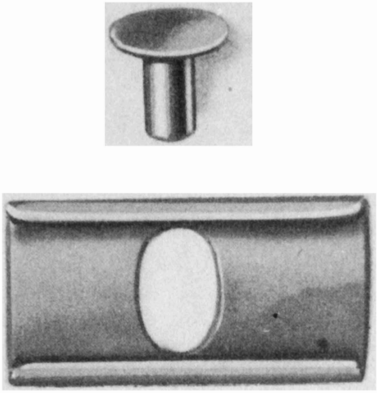


Figure 44—Rear Deck Cover Molding Retainer and Rivet.

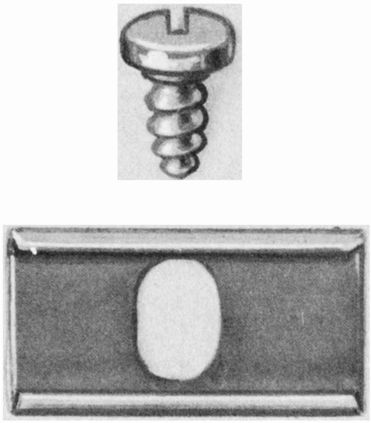
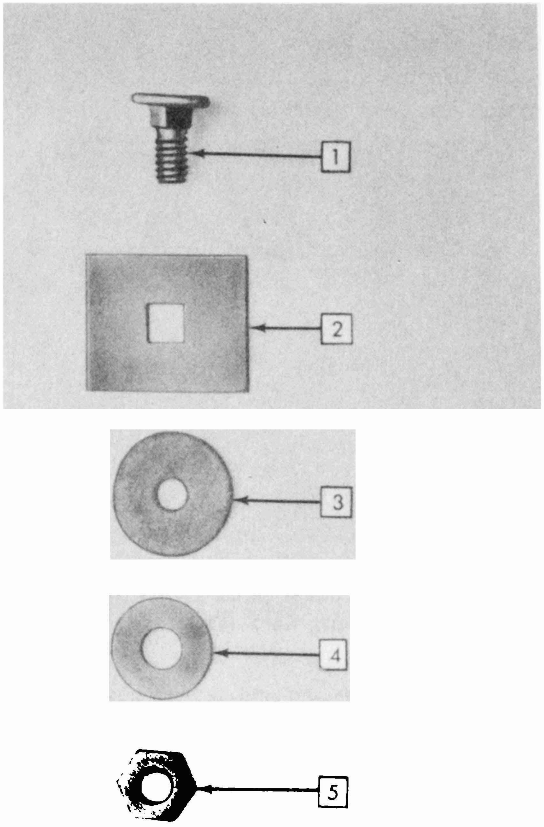


Figure 44-A—Rear Quarter Belt Molding Retainer and Screw.

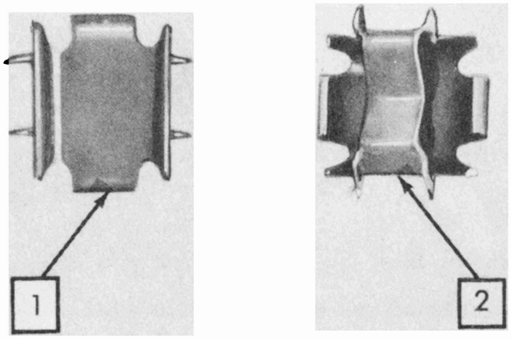
The rear deck lower center panel molding is bolted, with rubber sealer washers on the inside of the trunk compartment to eliminate any possible water leaks. This also insures easy removal and installation in service (Fig. 44-B).

Drain holes are provided in the bottom of the door to drain off any water that may enter around the glass. Therefore, the molding clips are not a seal type.



1. Bolt
2. Plate
3. Rubber sealer washer
4. Flat washer
5. Nut

Figure 44-B—Rear Deck Center Panel Lower Molding Retainer. (Bolt and Plate Inserted into Molding Flanges.)



1. Top view
2. Bottom view

Figure 44-C—Doors and Center Body Pillar Belt Molding Clips.

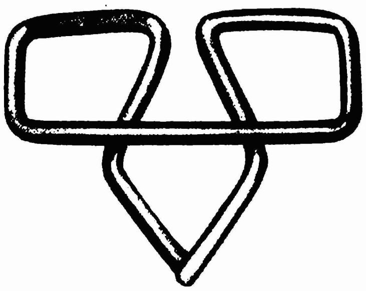
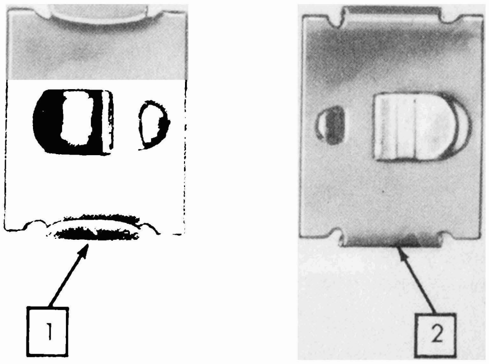


Figure 44-D—Center Body Pillar and Rear Fender Lower Molding Clip. (Inserted into Molding Flanges.)

Used at front end and at back curve of fender

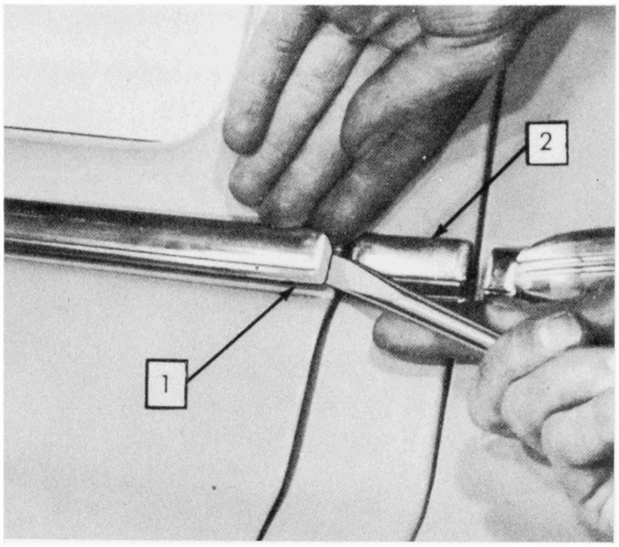


1. Top view
2. Bottom view

Figure 44-E—Rear Fender Side and Door Lower Molding Clip.

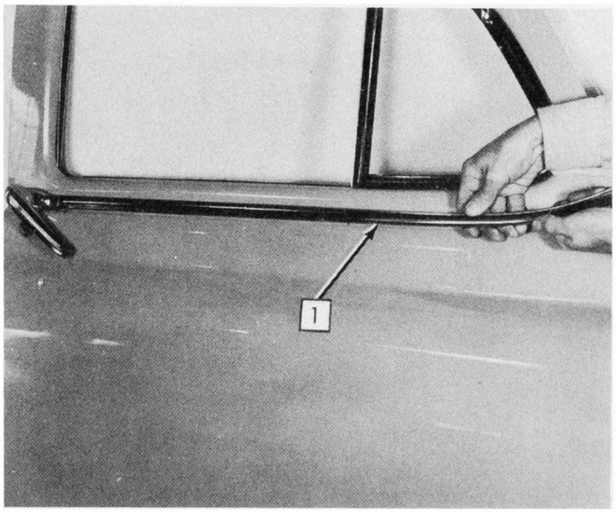
Removing Belt and Lower Moldings

1. Insert small screw driver under end of molding and pry bottom of molding off clip (Fig. 44-F).
2. Pull loosened end of molding away from body, and push molding down to unhook it from bottom of next clip. Twist bottom of molding away from body and then raise it to unhook top of molding from clip (Fig. 44-G).



1. Rear door belt molding
2. Center body pillar belt molding

Figure 44-F—Pry the End of the Molding up off the Molding Clip.



1. Belt molding

Figure 44-G—Removing Belt Molding.

Installation Procedure

3. Space molding on panel. Then hook bottom end of molding on bottom of clip. Now, with heel of hand, hit molding with glancing blow. This will push top of molding over top of clip. Continue this operation at each clip.

NOTE: *This removal and installation procedure will apply to all moldings except rear fender lower molding and rear deck lower panel molding (below rear deck opening).*

Removing Rear Fender Lower Molding

4. With rear door open pry end of molding away from body with small screwdriver. If end of clip is rusted, use pliers to close end of clip on inside of fender (Figs. 44-D and 44-E).
5. Remove this molding in the same manner as the belt molding (outlined on page 44, paragraph 2).
6. The same type of clips are used on the curve of the fender. Use pliers to close ends of each clip on inside of fender, and carefully pry molding and clip out of each hole in fender. Continue this procedure until molding is removed.

To Install Rear Fender Lower Molding

7. Adjust wire clips in back of molding and line them up with holes in curve of fender. Then push molding and force clips into holes in fender.
8. Now hook bottom of molding on bottom of clip on the side of fender. Then push top of molding over top of clip. Continue this operation at each clip until end clip is reached. Then adjust molding to line up with each hole in fender. Now push molding in, forcing each clip into holes in fender.

Removing Rear Deck Lower Molding

9. This molding is bolted to rear deck lower panel. Raise rear deck cover and pull insulation out of way. Now remove nuts, flat washers, rubber sealer and washers. Then push ends of bolts and molding away from body.

To Install Rear Deck Lower Panel Molding

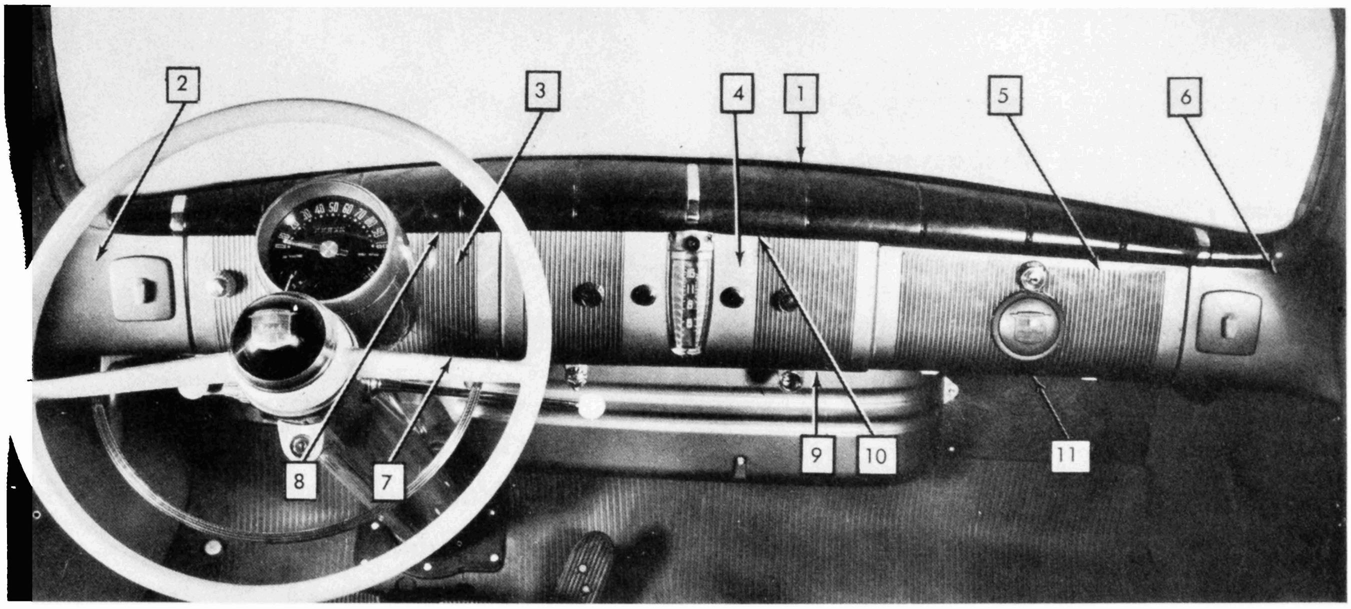
10. Adjust bolts and retaining plates in molding so that they line up with holes in body, and insert them through these holes.
11. Install rubber sealer washer, flat washers and nuts on bolts from inside of trunk compartment.

45. INSTRUMENT PANEL OVERLAYS

1949 "600" and "Ambassador 6" Series

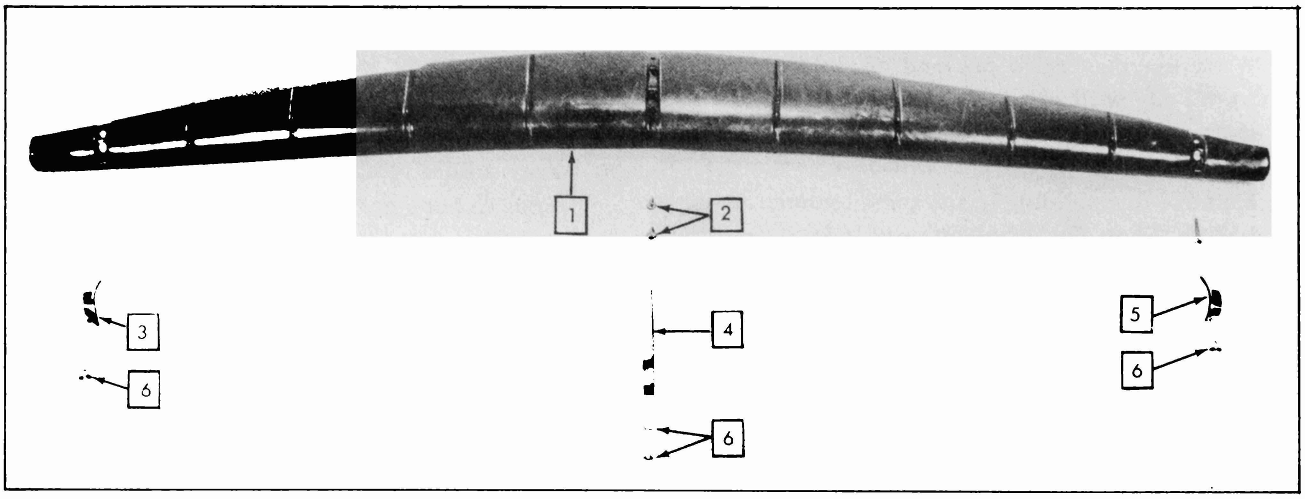
The instrument panel top overlay is a steel stamping having a grained finish.

The right and left end overlays, which retain the ash receivers, are also steel stamps with the ash receiver retainers welded to the inside flanges of the overlays.



1. Top overlay (Subject 46)
2. Left end overlay (Subject 49)
3. Left side overlay (Subject 47)
4. Center overlay (Subject 48)
5. Glove box door overlay (Subject 53)
6. Right end overlay (Subject 49)
7. Left side overlay bottom clip
8. Left side overlay top clip
9. Center overlay bottom clip
10. Center overlay top clip
11. Glove box door overlay bottom clip

Figure 45—Instrument Panel Overlays and Fastening Clips.



1. Top overlay
2. Center screws
3. Left end trim molding
4. Center trim molding
5. Right end trim molding
6. Trim molding clips

Figure 46—Instrument Panel Top Overlay Assembly.

The left side, center and the glove box door overlays are clear plastic with a special paint applied to the inside surfaces.

Extra precautions should be taken when handling overlays so as not to scratch or damage the outside or inside painted surface.

The removal procedure of each of these overlays differs; therefore refer to their subject number as shown in Figure 45.

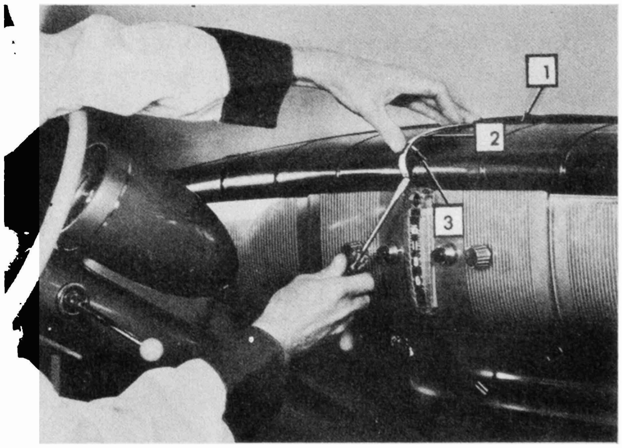
46. INSTRUMENT PANEL TOP OVERLAY

1949 "600" and "Ambassador 6" Series

Removal Procedure

1. Remove left end, center and right end trim moldings by inserting small screw driver under front end of trim molding and prying up molding, releasing clip from overlay (Figs. 46 and 46-A).
2. When trim moldings are removed, remove exposed screws that fasten overlay to instrument panel.
3. Lift overlay from instrument panel.

CAUTION: *Insulation pads are placed between the top overlay and the instrument panel. If they are loosened when the overlay is removed, they should be replaced in the same location when the overlay is installed. Care should also be exercised not to damage the finish on the overlay.*



1. Instrument panel top overlay
2. Center trim molding
3. Trim molding clip

Figure 46-A—Removing Instrument Panel Top Overlay Center Trim Molding.

47. LEFT SIDE INSTRUMENT PANEL OVERLAY

1949 "600" and "Ambassador 6" Series

Removal Procedure

1. Remove instrument panel top overlay (Subject 46).
2. Remove bottom clips (item 7, Fig. 45).
3. In some cases it may be necessary to loosen steering column support bracket (item 12, Fig. 45).
4. Remove top clips (item 8, Fig. 45).

5. Remove Weather-Eye and defroster control knobs.
6. Remove overlay from instrument panel.

To Install, Reverse Removal Procedure

48. INSTRUMENT PANEL CENTER OVERLAY (RADIO)

1949 "600" and "Ambassador 6" Series

Removal Procedure

1. Remove radio control knobs (Fig. 45).
2. Remove nuts holding radio control shafts to overlay.
3. Remove windshield wiper control bracket.
4. Remove cigar lighter bracket (on certain models).
5. Remove overlay bottom clip (on certain models).
6. Pull bottom of overlay away from instrument panel until radio shafts are out of overlay. Then carefully pull overlay down, releasing it from top clip under top overlay.

To Install, Reverse Removal Procedure

49. INSTRUMENT PANEL END OVERLAYS

1949 "600" and "Ambassador 6" Series

Instrument Panel Left End Overlay

Removal Procedure (See Fig. 45)

1. Remove instrument panel top overlay (Subject 46).
2. Remove instrument panel left side overlay. See Subject 47, Page 46.
3. Remove rear view mirror (Fig. 45).
4. Remove defroster outlet caps (Fig. 45).
5. Remove windshield finish molding.
6. Remove ash receiver.
7. Remove screws holding overlay to top, side and bottom of instrument panel and to front body pillar.

To Replace, Reverse Removal Procedure

Instrument Panel Right End Overlay

Removal Procedure

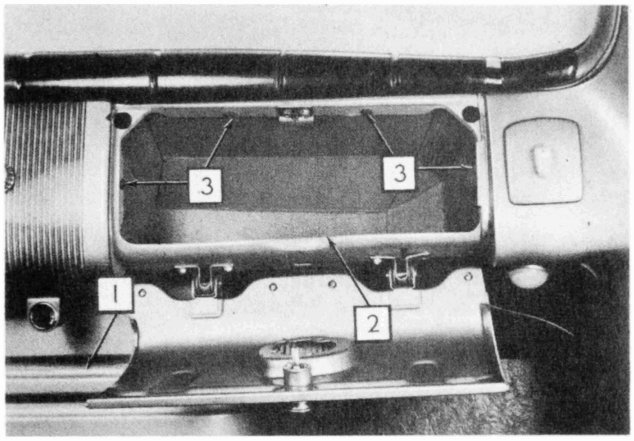
1. Remove instrument panel top overlay. See Subject 46, Page 46.
2. Remove rear view mirror.
3. Remove defroster outlet caps.
4. Remove windshield finish molding.
5. Remove ash receiver.
6. Remove screw, right side glove box opening (Fig. 50), also at top and bottom of instrument panel and front body pillar.

50. GLOVE BOX

1949 "600" and "Ambassador 6" Series

Removal Procedure

1. Remove Weather-Eye heat deflector.
2. Remove screws holding glove box to opening in instrument panel.
3. Push glove box forward from flange on instrument panel opening (Fig. 50).



1. Weather-Eye heater deflector
2. Glove box
3. Retainer screw

Figure 50—Glove Box and Retainer Screws.

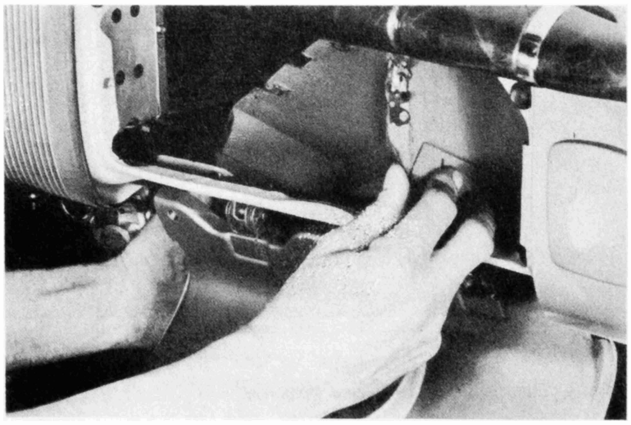


Figure 50-A—Removing Glove Box.

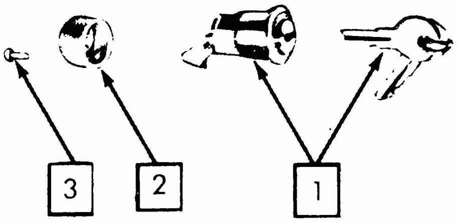
4. Tilt left side of box down to vertical position and lower complete box until it will just clear bottom of instrument panel. Then remove (Fig. 50-A).

To Install, Reverse Removal Procedure

51. GLOVE BOX LOCK

1949 "600" and "Ambassador 6" Series

The glove box lock is inserted through the glove box door from the outside. The lock retainer is set over the lock on the inside of the door. This lock retainer is held in place by a retainer screw, fastened to the lock housing (Fig. 51).

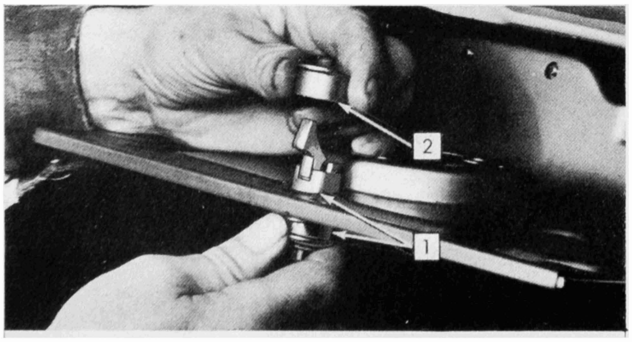


1. Lock and keys
2. Lock retainer
3. Retainer to lock screw

Figure 51—Glove Box Lock Assembly.

Removal Procedure

1. With door open, remove retainer screw.
2. Lift retainer from door and lock.
3. Remove lock from door (Fig. 51-A).

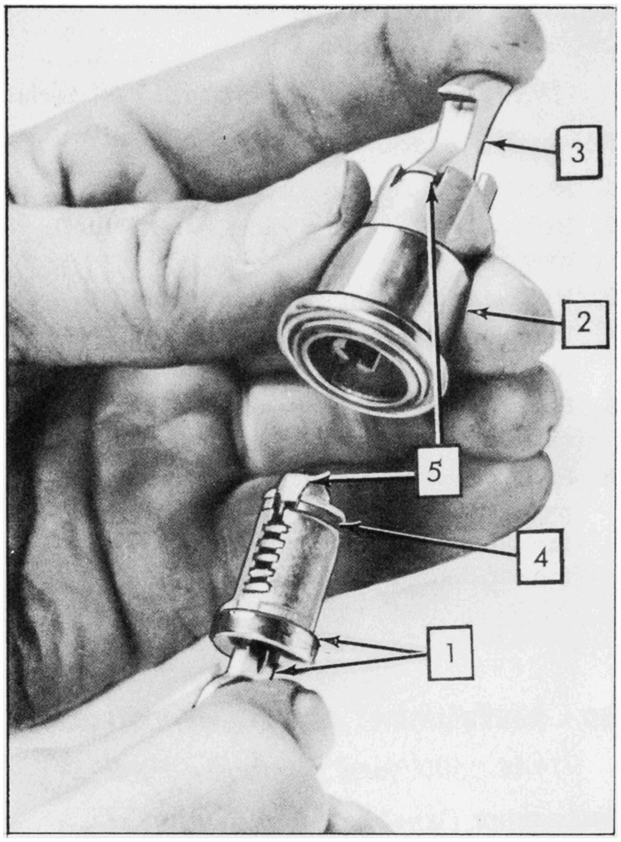


1. Lock
2. Lock retainer

Figure 51-A—Removing Glove Box Lock from Glove Box Door.

Removing Cylinder Lock from Lock Housing

For maintenance or lubrication, the cylinder lock may be removed from the lock housing *without removing the lock housing from the glove box door.* (Fig. 51-B).



1. Cylinder lock and keys
2. Housing
3. Lock catch
4. Cutout and locking groove in cylinder
5. Alignment for installation

Figure 51-B—Removing Cylinder Lock from Lock Housing (Glove Box Door Lock).

Removal Procedure

1. Insert key in lock to close tumblers.
2. With forefinger, press down on lock catch, holding it down or in the unlocked position.
3. Turn key and cylinder to right as far as possible.
4. Remove key and key cylinder from lock housing.

To Install

5. Hold lock catch down, as shown in Figure 51-B.

6. Insert the key in the lock.
7. With cut-out and locking groove (item 4, Fig. 51-B) upward and in line with lock catch (item 3), insert cylinder in housing until face of cylinder is flush with face of housing.
8. Turn key to left as far as possible.
9. Release lock catch, locking the cylinder in the housing.

Lubrication

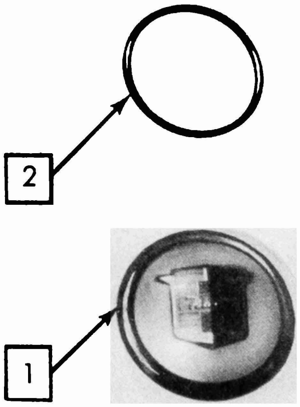
Use only powdered or flake graphite in the key cylinder lock.

52. GLOVE BOX DOOR—CLOCK OPENING COVER

1949 "600" and "Ambassador 6" Series

Removal Procedure

1. Open glove box door.
2. Push clock cover outward, from inside of door, then remove cover from door (Fig. 52).



1. Cover
2. Retaining ring (rubber)

Figure 52—Clock Opening Cover and Retaining Ring (rubber)—(Glove Box Door).

To Install

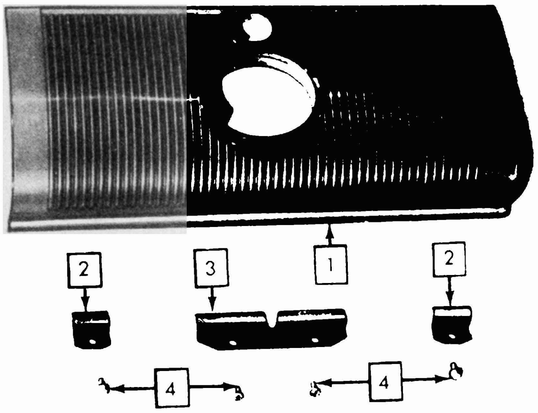
3. Place round rubber retaining ring on inside flange of cover.
4. Roll round retaining ring in groove at inside flange of cover.
5. Place cover against outside face of glove box door in cover opening, pushing cover into door opening as far as possible. This movement rolls rubber retainer out of groove of cover up tight against inside flange of glove box door, holding cover in place.

53. GLOVE BOX DOOR OVERLAY

1949 "600" and "Ambassador 6" Series

Removal Procedure

1. Remove glove box door lock (Subject 51).
2. Remove clock, or clock opening cover, from door (Subject 52).
3. Close glove box door and remove screws holding clips to bottom of door. Hold overlay tight against door to prevent falling when screws are removed (Fig. 53).



1. Overlay
2. End clips
3. Center clip
4. Clip screws

Figure 53—Glove Box Door Overlay Clips and Screws.

To Install, Reverse Removal Procedure

54. GLOVE BOX DOOR

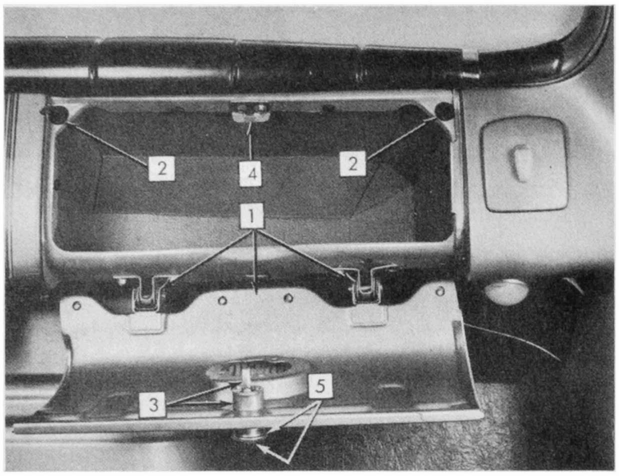
1949 "600" and "Ambassador 6" Series

1. Hinge Adjustment

The glove box door is adjustable at the hinges for proper alignment in the opening of the instrument panel.

2. Purpose of Rubber Bumpers

Two rubber bumpers are located at the upper corner of the instrument panel opening to cushion the door. This provides sufficient spring tension in the door for catching and releasing the lock catch from the striker plate when the door is opened or closed (Fig. 54).



1. Glove box door assembly and hinges
2. Rubber bumpers
3. Lock and lock catch
4. Lock striker plate
5. Lock handle and push button

Figure 54—Glove Box Door.

3. Striker Plate Adjustment

The lock striker plate is adjustable in and out, to hold the door firm against the rubber bumpers, *and permit the lock catch to engage the striker plate in a latched position under moderate closing of the door.*

4. Using Lock as Handle

The lock serves as a handle and push button control to open and close the door. A sufficient portion of the lock extends out of the door to provide a grip for the fingers. To release the lock catch from the striker plate, push the center portion of the lock in with the thumb.

5. Locking with Keys

When the door is closed and locked with the keys, this locks out any movement of the push button control. Therefore the lock catch cannot be moved to open the door until the push button control is released by unlocking it with keys.

6. Adjustments

Any adjustments made to the hinges and lock striker should result in free operation of the door as described in Paragraphs 3 and 4.

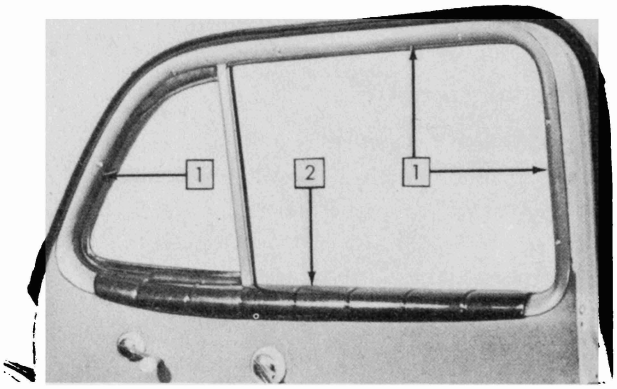
7. Lubrication

Apply a very thin coat of Lubriplate to the lock striker plate and lock catch.

55. FINISH MOLDING OVERLAY—FRONT AND REAR DOORS

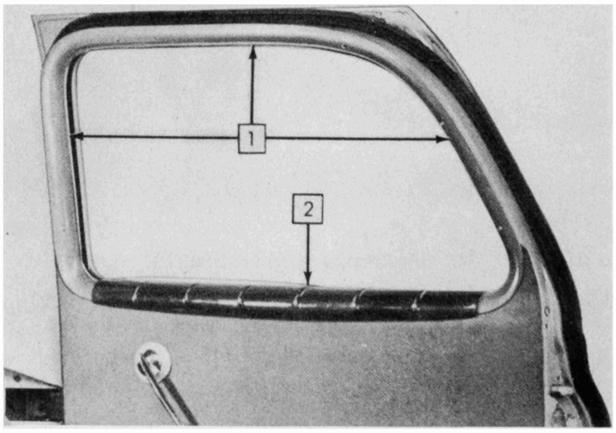
1949 "600" and "Ambassador 6" Series

The overlay on both front and rear door finish moldings is stapled to the inside flange of the finish molding. The edge of the overlay and staples are covered by the door glass weatherstrip, which is also stapled to the inside flange of the finish molding (Figs. 55 and 55-A).



1. Finish molding
2. Overlay

Figure 55—Front Door Finish Molding and Overlay.



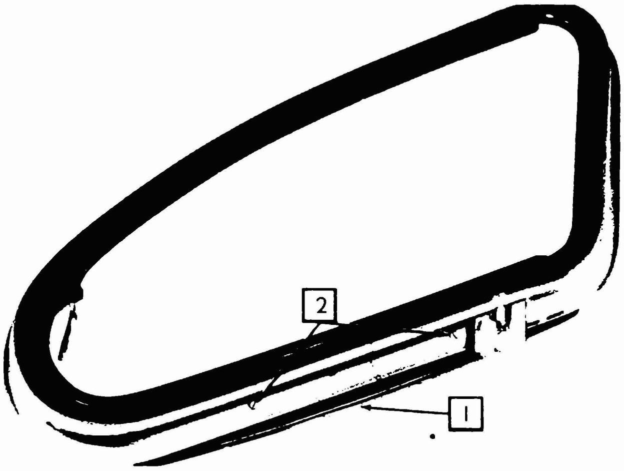
1. Finish molding
2. Overlay

Figure 55-A—Rear Door Finish Molding and Overlay.

The weatherstrip serves as a seal against the glass and prevents the staples from contacting the glass.

Rear Quarter Ventilator

The overlay on the rear quarter ventilator is screwed to the finish molding frame. It may be removed or replaced by removing the ventilator assembly from the car and removing the two fastening screws as shown in Figure 55-B.



1. Overlay
2. Overlay fastening screws

Figure 55-B—Rear Quarter Ventilator Overlay Removal.

For removal and installation of rear quarter ventilator assembly, see Subject 33.

56. WINDSHIELD STAINLESS STEEL REVEAL MOLDING

1949 "600" and "Ambassador 6" Series

The windshield reveal molding is one piece with an expansion joint in the center at the top. The joint is covered by a stainless steel clincher type cap that snaps on over the ends of the molding.

This molding is curved to conform to the one-piece curved windshield glass. When it is installed as an assembly with the glass and channel rubber, the inside "L" shaped flange extends into the channel rubber to the inside of the glass. This creates a bind between the outside face plate of the molding and the channel rubber and forces the outside lip of the channel rubber tight against the outer surface of the glass.

When assembled in the car, it is impossible to remove this molding without first removing the complete windshield assembly from the car. See Figure 58-D for cross section view of this assembly.

To remove or install this molding, see Subject 58.

57. REAR WINDOW STAINLESS STEEL REVEAL MOLDING

1949 "600" and "Ambassador 6" Series

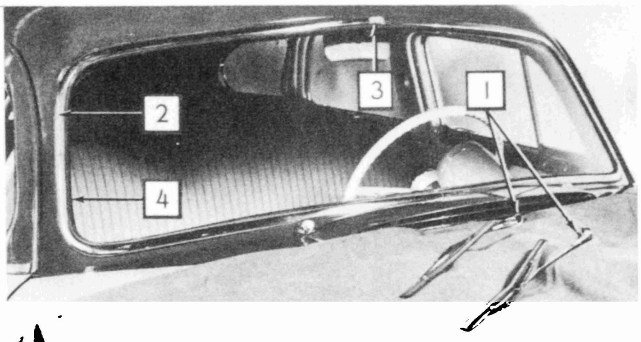
The rear window reveal molding is similar in design and serves the same purposes as the windshield reveal molding.

It is impossible to remove this molding without first removing the complete rear window assembly. This assembly consists of a channel rubber, glass and the reveal molding. For a cross section view of the assembly, see Subject 59, REAR WINDOW GLASS.

58. WINDSHIELD GLASS IN CARS EQUIPPED WITH STAINLESS STEEL REVEAL MOLDINGS

1949 "600" and "Ambassador 6" Series

The curved windshield glass is one piece of Bent Duplate Glass. It is set into the body from the outside as an assembly. This assembly consists of glass, channel rubber, and a stainless steel reveal molding.

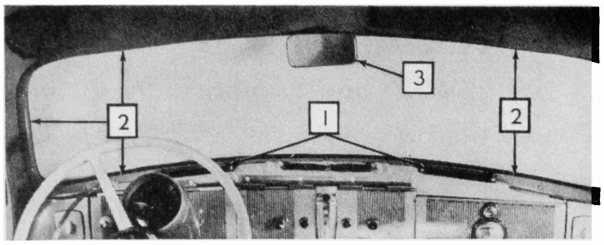


1. Wiper arms and blades
2. Stainless steel molding
3. Stainless steel molding joint cover plate
4. Channel rubber

Figure 58—Windshield Wiper—Arms and Blades Removed.

Removal Procedure

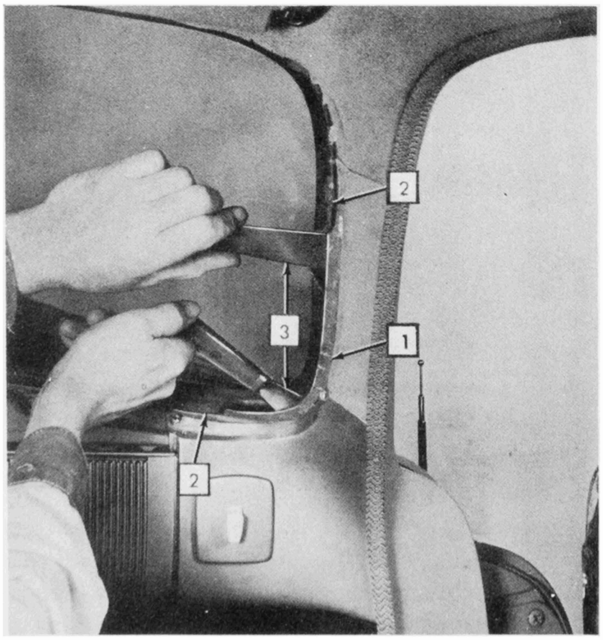
1. Place cover over top of hood and cowl for protection of paint.
2. Remove windshield wiper arms and blades (Fig. 58).
3. Remove instrument panel top overlay (Subject 46).
4. Remove rear view mirror, defroster caps, and finish molding (Fig. 58-A).



1. Defroster outlet caps
2. Windshield finish molding (one-piece, joint at bottom)
3. Rear view mirror

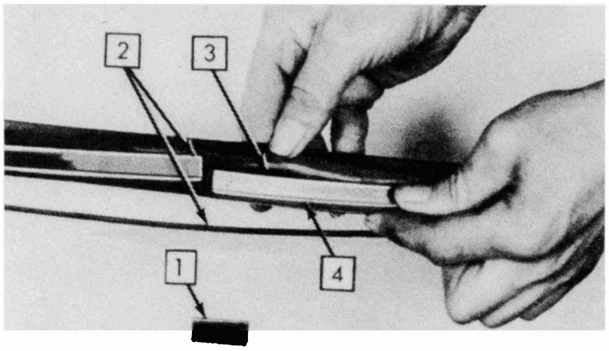
Figure 58-A—Parts to Be Removed for Removal of Windshield Glass.

5. Use fiber or hard wood wedge-shaped tool to break seal of rubber lip to windshield opening flange.
6. Use two putty knives to lift lip of rubber over flange of windshield opening, pressing glass assembly outward (Fig. 58-B). Then, from outside, lift glass assembly from windshield opening and place on padded bench or table.
7. Remove molding joint cover plate or slide on molding to expose joint.
8. Pull channel rubber away from glass, spread lip of rubber and carefully lift molding from groove in rubber (Fig. 58-C).
9. Remove channel rubber from glass.
10. With cloth dampened in gasoline, naphtha or cleaning fluid, remove all dried rubber cement from channel rubber and flange of windshield opening in body.



1. Windshield opening flange
2. Lip of windshield rubber
3. Putty knives

Figure 58-B—Removing Windshield Glass Assembly, Lifting Lip of Channel Rubber over Flange of Windshield Opening.

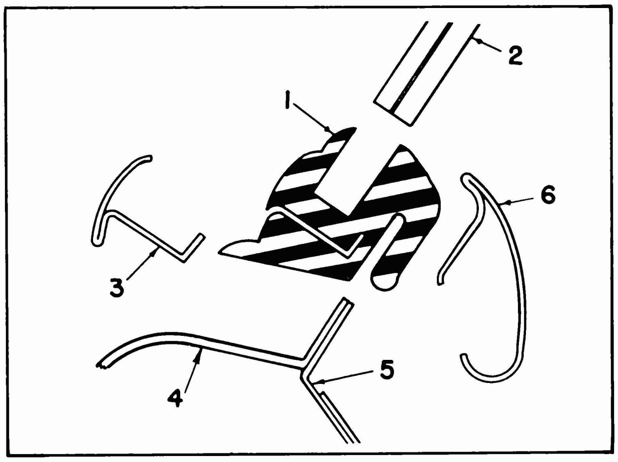


1. Molding cover plate removed
2. Rubber and molding pulled off glass
3. Spreading lip of rubber
4. Lifting molding from rubber

Figure 58-C—Removing Reveal Molding from Channel Rubber.

Glass Assembly Procedure

1. Install channel rubber (item 1) onto glass (item 2 of Figure 58-D) over one end of glass.

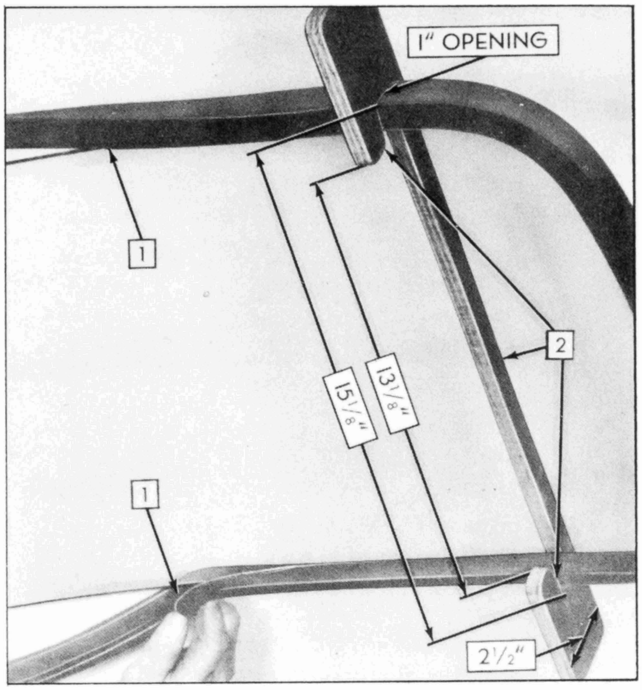


1. Channel rubber
2. Glass
3. Reveal molding
4. Cowl top
5. Dash panel
6. Finish molding

Figure 58-D—Exploded View of Windshield Glass

Assembly and Body Attaching Parts.

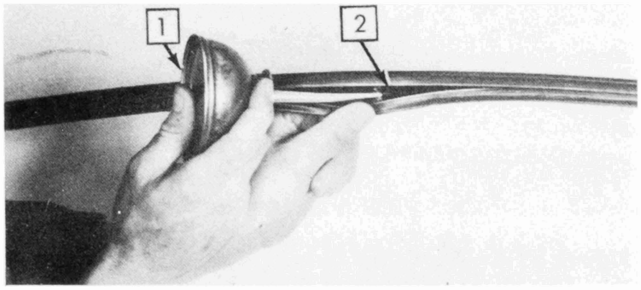
2. Install wood "C" clamp over end of glass and rubber to hold rubber on glass until it is completely installed (Fig. 58-E).



1. Installing rubber on glass
2. Wood "C" clamp (½" plywood) placed over end to hold rubber on glass until completely installed

Figure 58-E—Installing Channel Rubber on Windshield Glass.

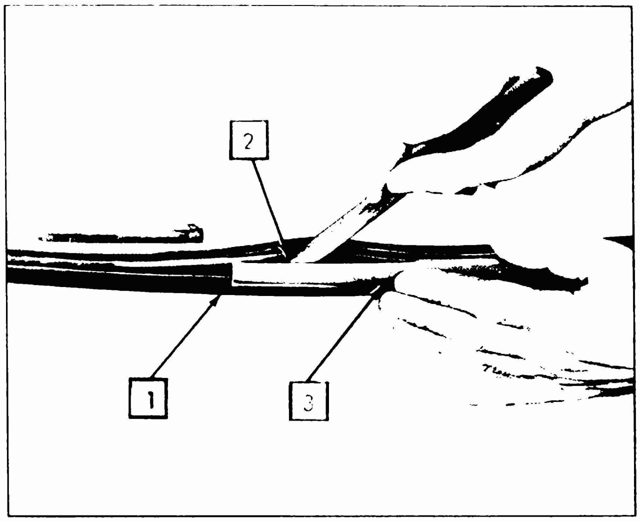
3. Apply liquid soap and water to molding groove in channel rubber (item 2, Fig. 58-F). This permits free movement of molding into channel rubber.



1. Liquid soap in oil can
2. Groove in rubber for stainless steel molding

Figure 58-F—Applying Liquid Soap to Molding Groove in Rubber After Rubber is Installed on Glass.

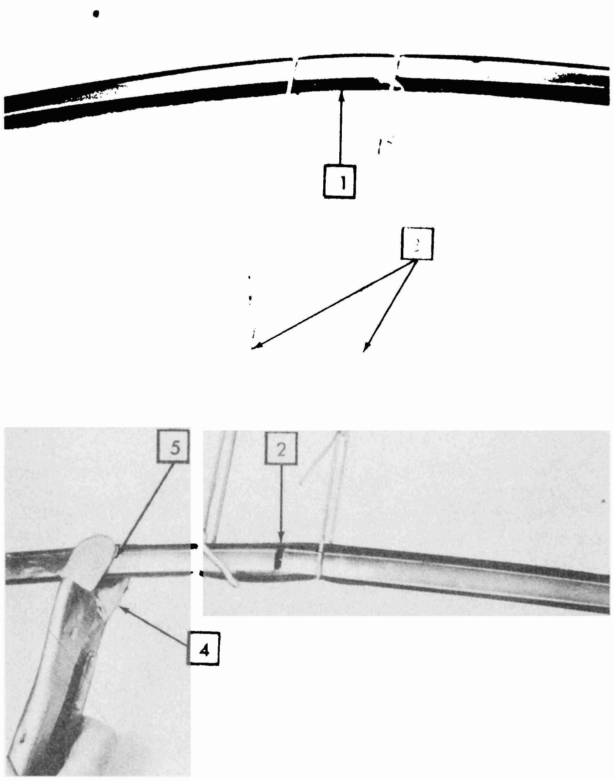
4. Space the molding on glass and rubber channel. Then start one end of molding in groove of rubber at top center of glass. Use a fiber or hard wood wedge-shaped tool to spread lip (Fig. 58-G). Open groove and push molding flange into groove (item 3, Fig. 58-G). Press molding down into rubber channel.



1. Top center of glass and rubber
2. Spreading lip to open groove in rubber
3. Pressing molding down into rubber

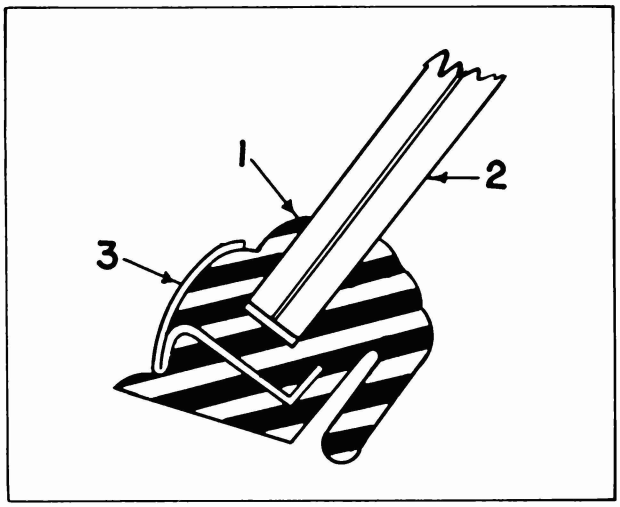
Figure 58-G—Installing Molding Into Groove of Rubber.

5. Tie a cord around center of glass to hold rubber and reveal molding onto glass. Continue with operation 4 until complete molding is set into groove of rubber. Now tie another cord around center of glass to hold other end of molding and rubber onto glass (Fig. 58-H). Each cord should be 4 ft. long.
6. With wide faced pliers, *taped to prevent scratching moldings,* lightly compress molding into rubber. Start at bottom center and work around glass to end of molding. Then start at bottom center and work around other end of glass to end of molding (Fig. 58-H). This procedure moves the molding in the rubber to the expansion joint, allowing the molding to seat properly in the rubber. (See Figure 58-I.)
7. Use two cords 9 ft. long. Start at top center of glass with one cord and insert cord in groove of rubber around one end of glass to bottom center. Then insert the other cord in groove of rubber around the other end of glass, overlapping ends of cords at both top and bottom center as shown in Figure 58-J.



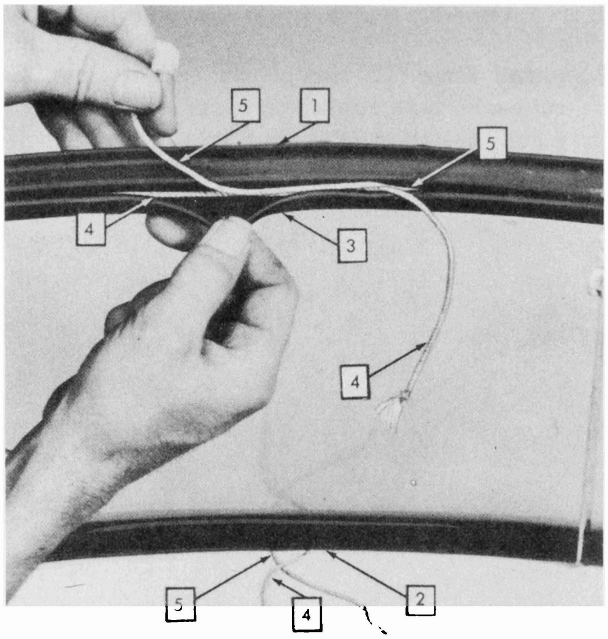
1. Bottom center of glass
2. Top center of glass
3. Cord holding rubber and molding to glass (4 ft. long)
4. Taped pliers
5. Compressing molding in rubber

Figure 58-H—Compressing Molding into Rubber



1. Channel rubber tight against glass
2. Glass
3. Reveal molding set into rubber with outside edges tight against rubber

Figure 58-I—Glass Assembly Properly Assembled.



1. Top center of glass
2. Bottom center of glass
3. Groove in rubber with cords overlapping at center
4. Ends of cord around left end of windshield
5. Ends of cord around right end of windshield

Figure 58-J — Inserting Two Cords in Groove of Channel Rubber (Used to Lift Lip of Rubber over Flange of Windshield Opening.)

Installation Procedure of Windshield Glass Assembly in Body

1. Apply Nash rubber cement to *bottom of flange* on outside of windshield opening (Fig. 58-K).

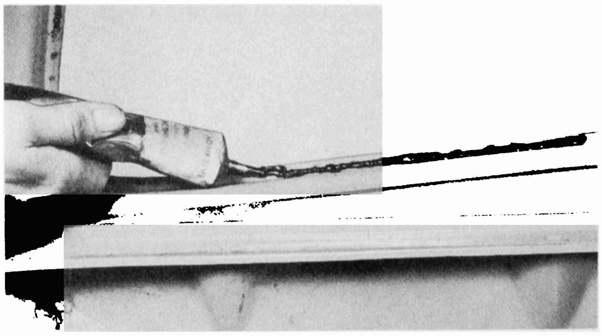


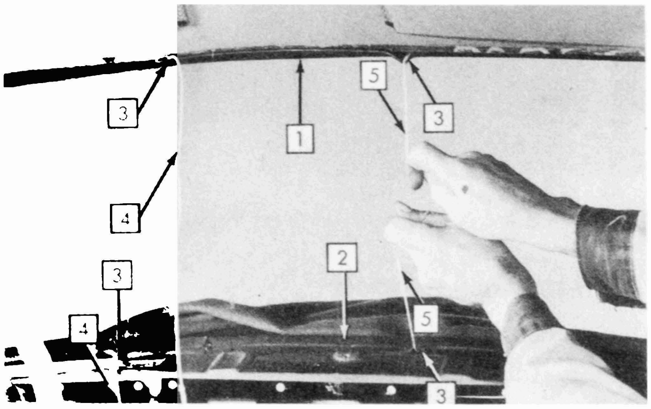
Figure 58-K—Applying Rubber Cement to Bottom of Flange on Outside of Windshield Opening.

CAUTION: *Do not apply cement to top of body flange, as it will come off when lip of rubber is lifted over windshield opening flange and will require considerable cleaning to finish job.*

2. Place glass assembly, with rubber and molding installed, into windshield opening, from outside of body. Center the assembly in windshield opening. Now remove cords that were installed to hold rubber and molding onto glass (item 3, Fig. 58-H).
3. From the inside of car, pull both top cords to lift lip of rubber over the windshield opening flange. Start at top center and lift rubber lip for a distance of 6 inches.

   Now pull both bottom cords, lifting lip of rubber over windshield opening flange at bottom center for a distance of 6 inches.
4. Pull top and then bottom cords on right until complete right side is in place.

   Pull top and then bottom cords on left side until complete left side is in place (Fig. 58-L).



1. Top center
2. Bottom center
3. Lifting lip of rubber over flange of windshield opening
4. Left end cord—top and bottom end
5. Right end cord—top and bottom end

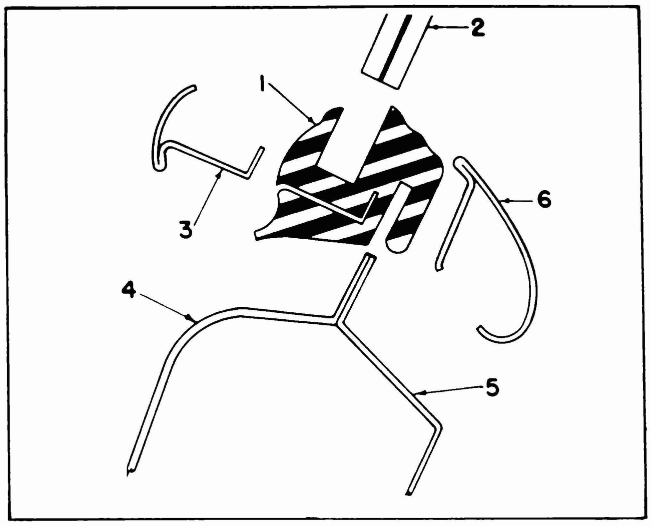
Figure 58-L—Lifting Lip of Channel Rubber over Flange of Windshield Opening.

5. Install finish molding defroster outlet caps and rear view mirror.
6. Install instrument panel top overlay.
7. Clean glass and install windshield wiper arms and blades.

59. REAR WINDOW GLASS IN CARS EQUIPPED WITH STAINLESS STEEL REVEAL MOLDING

1949 "600" and "Ambassador 6" Series

The curved one-piece rear window glass is known as Bent Herculite.

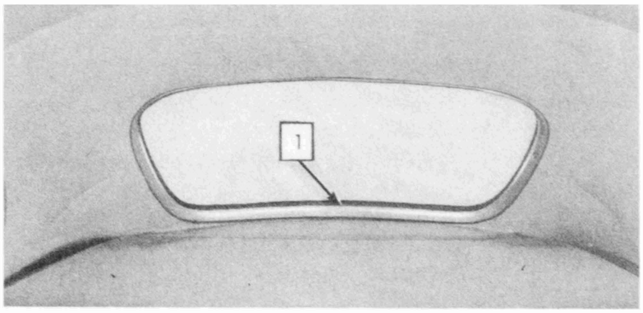


1. Channel rubber
2. Glass
3. Reveal molding
4. Roof panel (under window)
5. Rear window frame (inside body)
6. Finish molding

Figure 59—Exploded Cross Section View of Rear Window Assembly and Body Attaching Parts.

The glass is set into the body from the outside as an assembly. This assembly consists of glass, channel rubber, and a stainless steel reveal molding (Fig. 59).

The procedures for removal and installation follow the same principles as for the windshield (Subject 58).



1. Finish molding

Figure 59-A—Rear Window Finish Molding.

Removal Procedure

Refer to Subject 58, WINDSHIELD REMOVAL PROCEDURE.

Glass Assembly Procedure

Refer to Subject 58, WINDSHIELD GLASS ASSEMBLY PROCEDURE.

NOTE: *The "C" clamps are not required for the installation of this glass.*

Installation Procedure of Rear Window Assembly in Body

Refer to Subject 58, INSTALLATION PROCEDURE OF WINDSHIELD GLASS ASSEMBLY IN BODY.

60. CORRECTION OF WATER LEAKAGE AT WINDSHIELD OR REAR WINDOW ON CARS EQUIPPED WITH STAINLESS STEEL REVEAL MOLDINGS

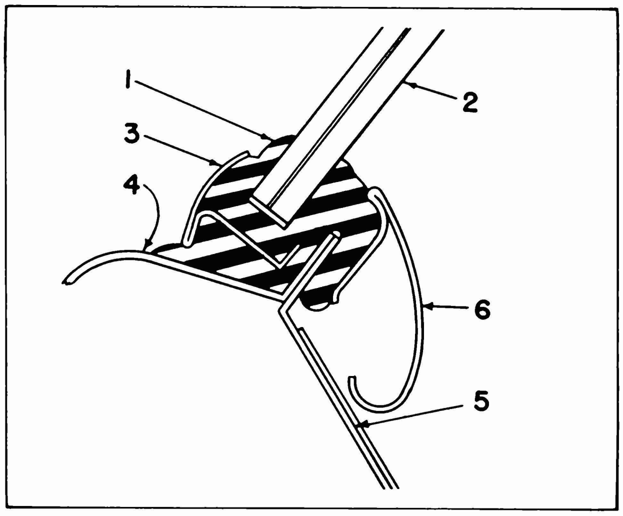
1949 "600" and "Ambassador 6" Series

Many times it is assumed windshields leak when in reality the leakage is from another source. Possible sources are loose windshield wiper pivot shafts at top of cowl, clogged cowl ventilator drain troughs, loose hood lacing screws, loose screws on outside of dash, or insulation pad clips.

Leakage between sealer rubber and glass can be observed without removing any parts.

To locate leakage between sealer rubber and body it is necessary to remove the finish molding.

To correct leakage at either source it is necessary to remove the finish molding and reseal.



1. Channel rubber
2. Glass
3. Reveal molding
4. Cowl top
5. Dash panel
6. Finish molding

Figure 60—Cross Section Windshield Glass or Rear Glass Assembly Set into Body. (5 Becomes Rear Window Frame for Rear Glass Assembly.)

Sealing Windshield

1. Remove instrument panel top overlay (Subject 46).
2. Remove rear view mirror, defroster caps and finish molding (Fig. 58-A).
3. To seal between channel rubber and body, use pressure gun to apply rubber cement (Fig. 60A).

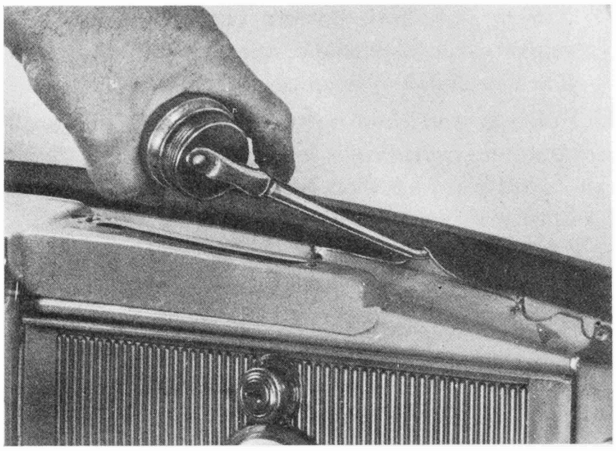


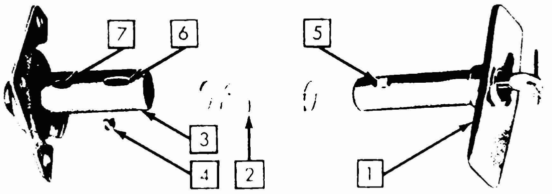
Figure 60-A—Sealing Between Rubber and Body.

Sealing Rear Window

1. Remove finish molding (Fig. 59-A).
2. To seal between channel rubber and body, use pressure gun (Fig. 60-A).

61. REAR DECK COVER KEY LOCK HANDLE

1949 "600" and "Ambassador 6" Series



1. Key lock handle
2. Lock release spring
3. Lock
4. Handle locking screw
5. Handle lock bolt
6. Lock bolt slot (open position)
7. Lock bolt slot (closed or locked position)

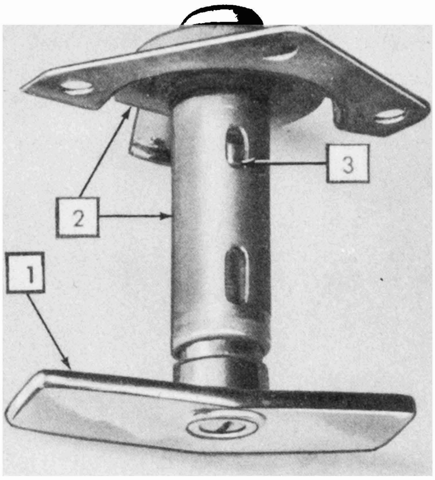
Figure 61—Rear Deck Cover Key Lock Handle and Lock.

REAR DECK COVER KEY LOCK HANDLE

Operation

The rear deck cover key lock handle is held into the cylinder of the deck cover lock by a set screw. This set screw is concealed when the deck cover is closed (Fig. 61).

The deck cover lock cylinder has two open slots to engage the key lock handle lock bolt. One slot engages the lock bolt when the handle is pushed in flush to the locked position (Fig. 61-A).



1. Rear deck handle
2. Rear deck lock and cylinder
3. Handle lock bolt locked in deck cover lock cylinder (closed position slot)

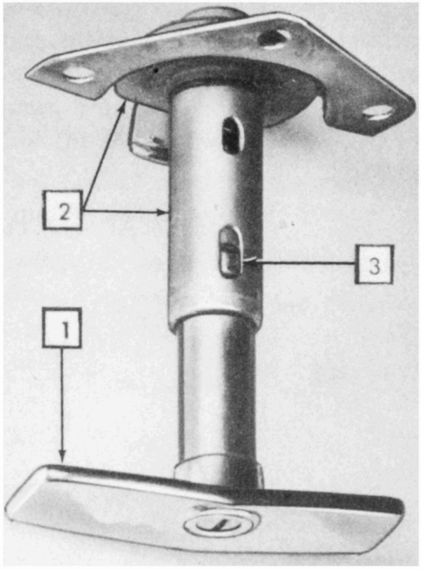
Figure 61-A—Rear Deck Handle Locked in Closed Position.

When the handle is extended, the other slot engages the lock bolt for operation of the cover lock to open or close the cover (Fig. 61-B).

The deck cover handle cannot be extended to operate the cover lock until it is unlocked with the key. To unlock, turn the key one-fourth turn to the left. This releases the key lock bolt from the slot in the cover lock and a coil spring in the lock cylinder automatically extends the handle (Figs. 61 and 61-C).

The key can be removed only when the handle is in the extended position. It is not necessary to have the key in the handle when it is pushed back to its locked position.

Turning the deck cover handle one-half turn to left will release the cover lock for opening the cover (Fig. 61-D). After the cover is closed, turn the handle one-half turn to right. This will lock the cover to the body.



1. Rear deck handle
2. Rear deck lock and cylinder
3. Handle lock bolt locked in deck cover lock cylinder (open position slot)

Figure 61-B—Rear Deck Handle Locked in Open Position.

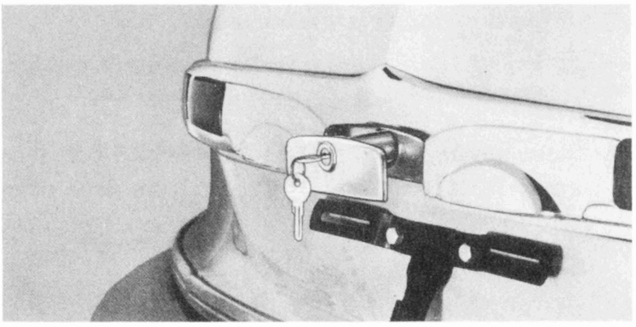
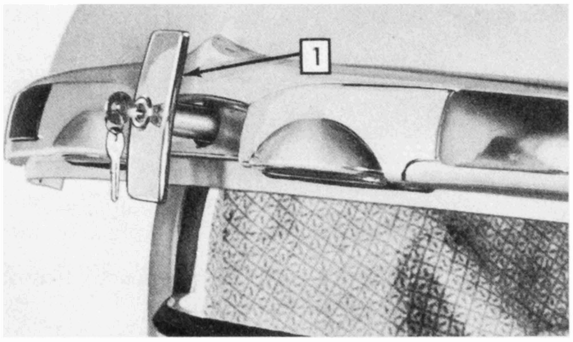


Figure 61-C—Rear Deck Handle in Extended Position.



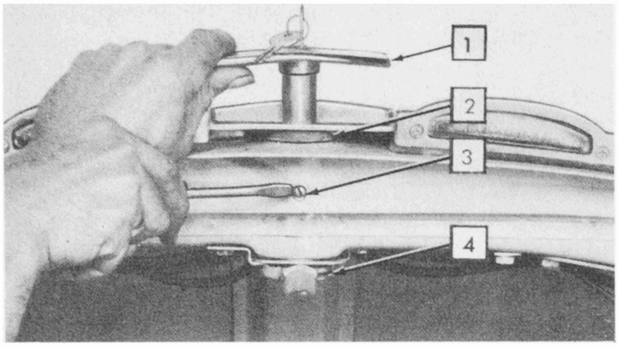
1. Handle turned one-half turn to left releases trunk cover lock. Cover can then be raised.

Figure 61-D—Turning Handle to Raise Cover.

Removing Deck Cover Handle

With deck cover raised, key in handle, and handle extended to horizontal position:

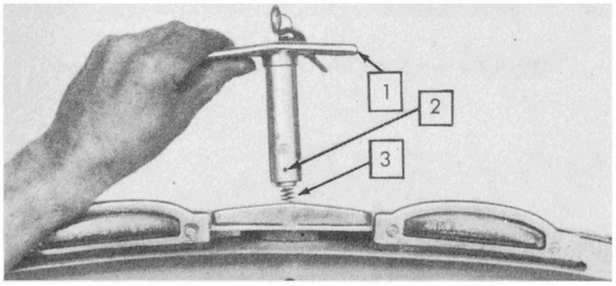
1. Move handle down into lock until handle locking screw is in line with hole in deck cover (Fig. 61-F).
2. Remove handle locking screw (item 3, Fig. 61-E).



1. Key lock handle
2. Handle rubber sealer
3. Handle locking screw
4. Trunk cover lock
   (Handle turned in horizontal position exposes handle locking screw for removal)

Figure 61-E—Removing Handle Locking Screw for Handle Removal from Deck Cover Lock.

3. Turn key to left to release handle lock bolt from cover lock cylinder. Lift handle from deck cover and lock cylinder (Fig 61-F).



1. Key lock handle
2. Threaded hole for retaining screw
3. Lock release spring

Figure 61-F—Removing Deck Cover Handle from Lock.

CAUTION: *Remove lock release spring to avoid misplacing it (item 3, Fig. 61-F).*

To Install, Reverse Removal Procedure

Maintenance

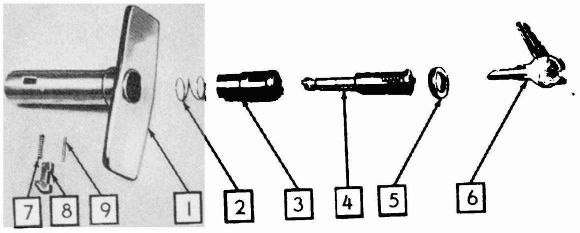
Cleaning

Gasoline (one that does not contain lead) may be used for cleaning, or the lock may be removed, disassembled and cleaned with alcohol or benzol. Blow out with air hose and lubricate.

Lubrication

Finely powdered graphite is recommended as a lubricant for all working parts of the handle assembly.

The rear deck handle assembly consists of several working parts. Figure 61-G shows them in their assembly sequence.



1. Handle
2. Spring
3. Housing
4. Cylinder and shaft
5. Bezel
6. Keys
7. Lock bolt spring
8. Lock bolt
9. Cylinder and shaft retaining pin

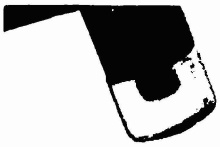
Figure 61-G—Rear Deck Handle Assembly.

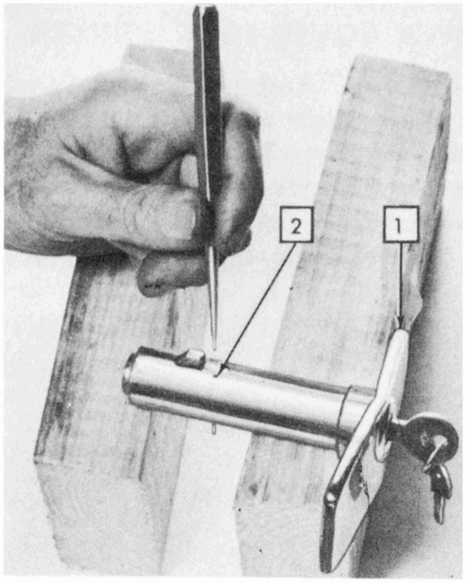
Handle Disassembly Procedure

1. Place handle on two wood blocks to prevent damage to handle.
2. Use small drift to remove cylinder to shaft retaining pin (Fig. 61-H).
3. Hold handle with finger over bezel (item 2) and thumb over lock bolt (item 4) as shown in Figure 61-I.
4. Tap end of handle shell lightly with plastic mallet until bezel is loose (Fig. 61-I).
5. Release thumb pressure on lock bolt and remove lock bolt and lock bolt spring.
6. Release pressure of finger on bezel and remove bezel, key cylinder, housing, and spring from handle shell.
7. Clean and lubricate.

To Assemble, Reverse Removal Procedure

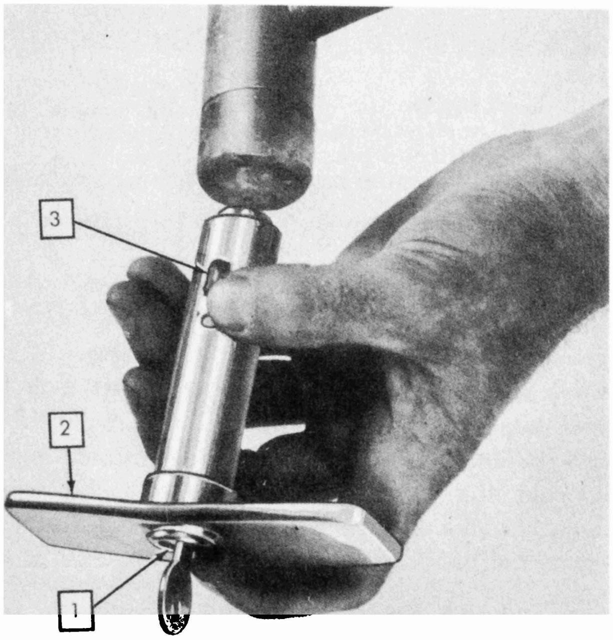
8. After cylinder to shaft retaining pin is installed,





1. Handle
2. Cylinder and shaft retaining pin

Figure 61-H—Removing Key Lock Assembly from Rear Deck Cover Handle.



1. Bezel
2. Handle
3. Lock bolt

Figure 61-I—Removing Bezel from Handle (Around Key Lock Cylinder).

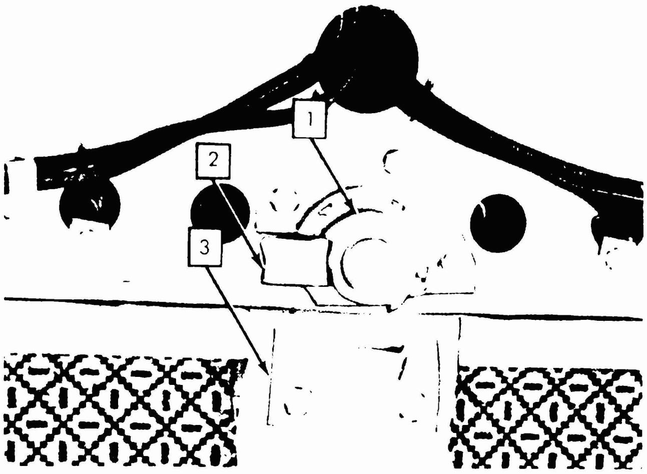
it should be carefully staked in on both sides to prevent any movement. See Figure 61-H.

9. Install handle in deck cover and lock.

62. REAR DECK COVER LOCK

1949 "600" and "Ambassador 6" Series

The rear deck cover lock is provided with a cylinder housing that extends into the deck cover from the inside (Fig. 62). The rear deck handle shaft is inserted into the cover and lock housing from the outside.



1. Deck cover lock
2. Lock bolt (in unlocked position)
3. Lock striker and catch

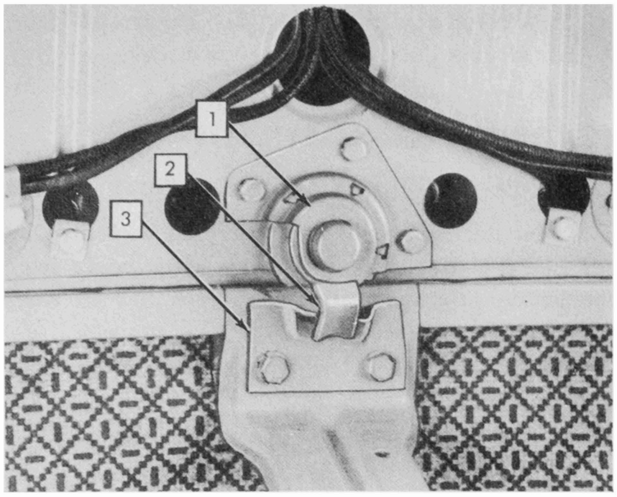
Figure 62—Rear Deck Cover Unlocked.

The lock handle housing has two slots on its upper surface for the operation of the handle lock bolt. There is also a long slot on the bottom surface for the handle locking screw, which permits the handle to move from the locked position to the extended position (Fig. 62-B).

When the lock handle housing is extended into the lock case, it is fastened to the lock bolt.

When the deck cover is raised, a lock bolt return spring in the lock returns the lock bolt to the unlocked or open position (Fig. 62-A). This eliminates the possibility of damaging the lock bolt when the deck cover is being closed, unless the handle is deliberately turned.

The lock case is fastened to the inside of the rear deck cover by three cap screws. The screw holes in the lock case are slightly oversize to allow for alignment.



1. Deck cover lock
2. Lock bolt (in locked position)
3. Lock striker and catch

Figure 62-A—Rear Deck Cover Locked.

Removal Procedure

1. Remove key lock handle (Figs. 61-E and 61-F).
2. Remove three screws holding lock to cover, and remove the deck cover lock (Fig. 62-B).

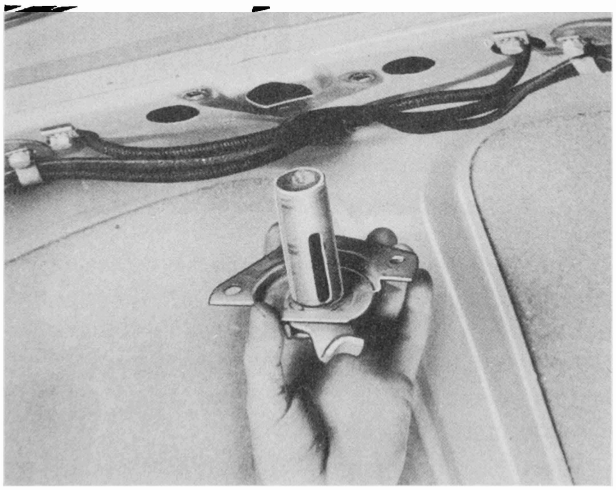


Figure 62-B—Removing Deck Cover Lock from Cover.

The action of the lock bolt engaging the lock striker should be free, yet firm so as to compress the deck cover sealer rubber. Lubricate and adjust lock striker as required.

Lubrication

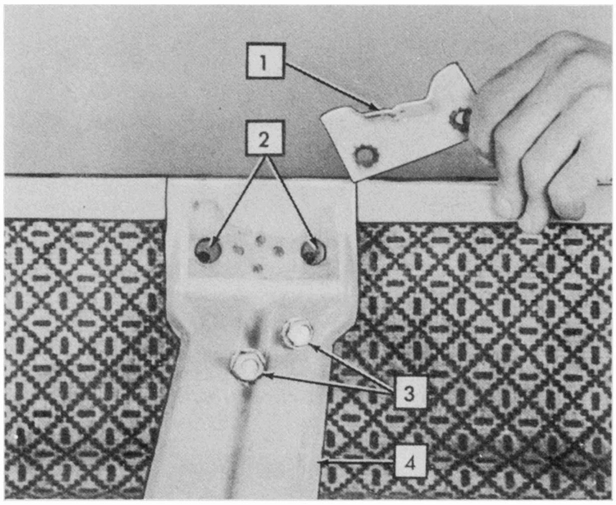
Use engine oil in lock mechanism and around the lock bolt, also between the handle and the handle cylinder. This can be applied at handle retaining screw hole.

Lubricate both the lock bolt and striker plate with a thin film of Lubriplate.

63. REAR DECK COVER LOCK STRIKER

1949 "600" and "Ambassador 6" Series

The rear deck cover lock striker is fastened to a tapped movable lock plate. This lock plate is encased in the rear deck lower center panel to floor pan brace. Movement of the striker plate is for adjustment of the rear deck cover lock (Fig. 63).



1. Lock striker
2. Striker adjustable lock plate
3. Lock striker screws
4. Rear deck lower center panel to floor pan brace

Figure 63—Rear Deck Cover Lock Striker.

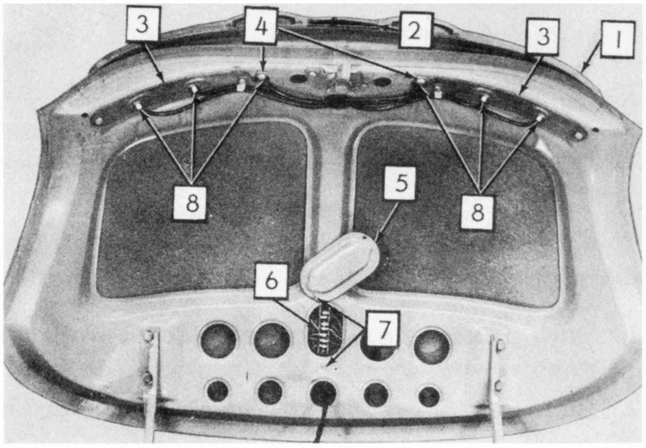
The striker plate can be moved up, down or sideways as required to contact and hold the lock bolt properly. To adjust the striker plate, move it sideways so that the convex portion of the lock bolt will pass over center on the convex portion of the lock striker. It should also be moved down enough so that the cover compresses the sealer rubber slightly. This will hold the cover firm but will not cause the handle to turn hard. See Figures 62 and 62-A.

64. REAR DECK COVER ORNAMENT

1949 "600" and "Ambassador 6" Series

The rear deck cover ornament contains the individual lenses for the directional signal lights, the stop lights and the license plate lights. These lenses are fastened and sealed to the ornament from the inside by retaining plates. The individual sockets for the directional lights and tail lights are in the right and left lamp housing. They can be removed individually for bulb replacement without removing the housing.

The license plate lights are fastened to the rear deck cover inner plane. They are removed by removing one screw that holds the light socket bracket to the deck cover inner panel. The wire harness for these lights enters the deck cover at the top center (item 7, Fig. 64), and connects to a junction block (item 6, Fig. 64), under the inner panel of the rear deck cover.



1. Ornament
2. Key lock handle
3. Lamp housing (tail and directional)
4. License lamp socket
5. Junction block cover
6. Junction block
7. Junction block screws
8. Each socket removable individually

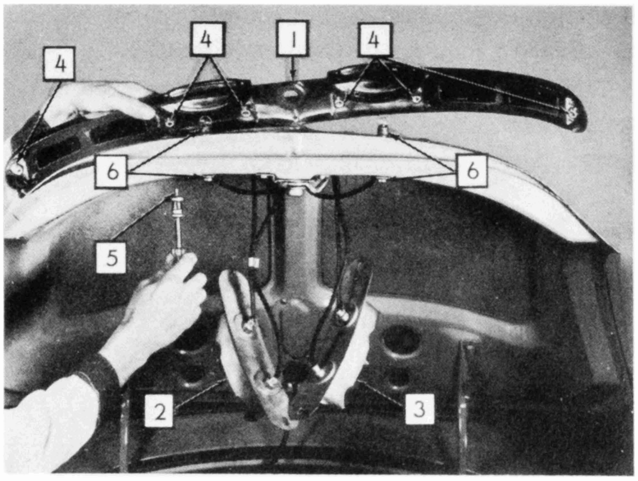
Figure 64—Rear Deck Cover Ornament.

Removal Procedure

1. Remove cover key lock handle (Fig. 61-F).
2. Remove left and right lamp housings.
3. Remove six cap screws through cut-outs in cover inner panel (Fig. 64-A).
4. Lift ornament off deck cover.

To Install, Reverse Removal Procedure

CAUTION: *When removing or installing ornament, care should be exercised not to damage gaskets. If they become loose, re-cement them in place.*



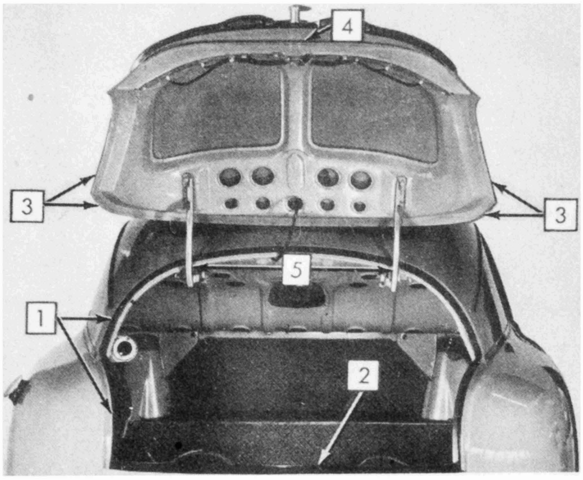
1. Ornament
2. Lamp housing—left
3. Lamp housing—right
4. Tapped holes in ornament
5. Cap screw—removed from ornament
6. License lamps removed from inside of the deck cover

Figure 64-A—Removing Rear Deck Cover Ornament.

65. REAR DECK COVER HINGES

1949 "600" and "Ambassador 6" Series

The rear deck cover interior hinges are counterbalanced with a coil spring. This provides for easy

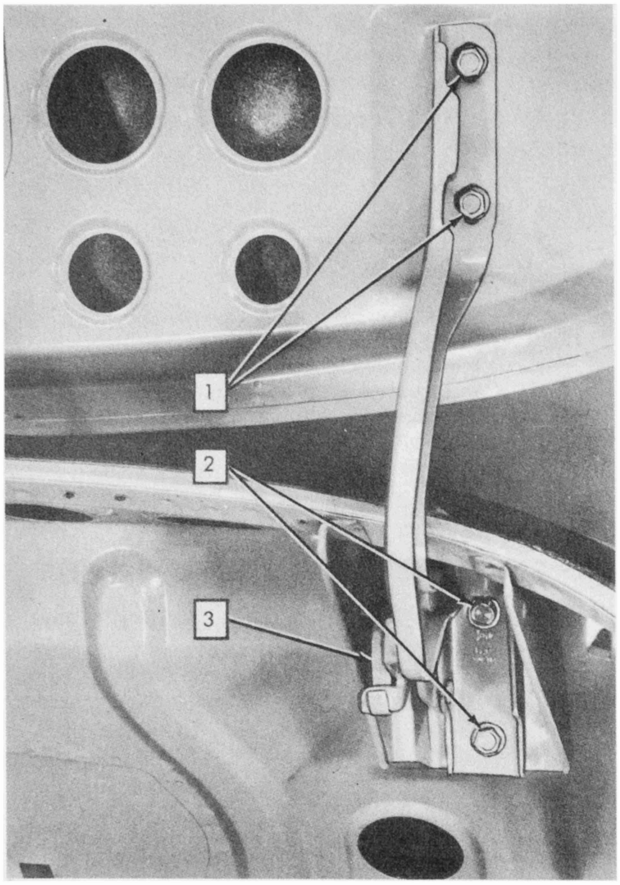


1. Sealer rubber—top and sides
2. Sealer rubber—bottom
3. Flange on deck cover contacting sealer rubber—top and sides
4. Flange on deck cover contacting sealer rubber—at bottom
5. Deck cover hinges

Figure 65—Rear Deck Cover Hinges with Coil Springs and Sealer Rubber.

operation of the deck cover as well as for holding the cover in the raised position (Fig. 65).

The hinges are provided with elongated holes for adjustment of the cover to the hinges and the hinges to the body (Fig. 65-A).



1. Elongated holes in hinges to cover
2. Elongated holes in hinges to body
3. Hinge coil spring

Figure 65-A—Deck Cover Hinges Adjustable to Body and Cover.

Adjustment

1. To move cover up or down, loosen the rear deck cover hinge screws and move cover as desired.
2. To move the cover sideways and center it in the opening, loosen rear deck cover hinge screws and move cover as desired. If this does not provide sufficient movement, loosen body hinge screws, and move cover and hinges as desired.
3. To adjust the cover so it will close more tightly on the sealer rubber along the top edge, loosen body hinge screws and move hinges down on the body. Raise hinges if cover is too tight on the sealer rubber.

NOTE: *It may be necessary to increase the size of the holes in the hinges to make this adjustment. This can be done by filing the present holes.*

Removing Hinges for Replacement

1. Remove hinge from body and cover.
2. Install new hinge.
3. Adjust from outside unless assistance is available to advise adjustment required. In this case, adjustments can be made from inside with the cover closed.

66. REAR DECK COVER

1949 "600" and "Ambassador 6" Series

The rear deck cover consists of an inner and outer panel flanged and spot welded together at the flange. They are available in service with a prime paint coat.

Removing Deck Covers

1. Raise cover, open terminal block cover, and remove wires from body to terminal block.
2. Place heavy pad between body and top edge of cover.
3. Loosen all screws, hinges to cover.
4. Hold cover firm so as not to damage cover or body when screws are removed.

To Install, Reverse Removal Procedure

Installing New Deck Cover

1. Cover should be primed and painted before installation.
2. Install hinges to body.
3. Install cover on hinges, closing the cover. Then space the cover so that it is even at sides, top and bottom, and tighten all screws.
4. Rivet molding clips to sides of cover and install molding. See Subject 44.
5. Install terminal junction block (Fig. 64).
6. Insert body wiring harness into cover and hook up to terminals.
7. Install ornament and lights (Fig. 64-A).
8. Hook up light wires to terminal junction block.
9. Check switches and brake for proper operation of lights.

10. Install terminal junction cover plate.
11. Install cover lock. See Subject 62.
12. Install key lock handle. See Subject 61.

67. REAR DECK COVER SEALER RUBBER

1949 "600" and "Ambassador 6" Series

The rear deck cover sealer rubbers are of sponge rubber. Their purpose is to seal around the deck cover, eliminating possible water leaks between the rubber and the cover.

These rubbers are in two pieces. The top and sides form one piece, and the bottom the other. They are cemented in a steel channel around the deck cover opening in the body (Fig. 65).

The channel on the top of the deck cover opening is stamped into the roof panel, and into the rear deck center lower panel at the bottom. The channel is formed on the sides by flanges on the rear quarter side panels and rear fenders.

The flanges on the rear quarter side panels make up the bottom and inside flanges of the channel while the flanges of the fenders make up the outside of the channel.

69. COWL VENTILATOR

1949 "600" and "Ambassador 6" Series

The cowl ventilator serves as an intake for fresh air.

The volume of air entering the car through the cowl ventilator can be controlled by opening and closing the inside cowl ventilator cover (item 1, Fig. 69).

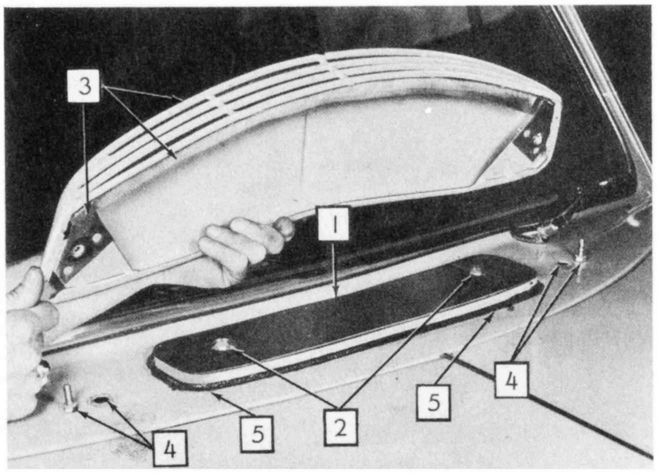
The inside cowl ventilator cover is molded rubber, steel reinforced. It is concealed under the cowl ventilator hood and screen assembly on the top of the cowl. It is fastened to the cowl ventilator handle assembly by two screws.

The screw holes in the cover are oversize. This permits adjustment of the cover to the ventilator opening to insure positive sealing when the cover is closed.

Cowl Ventilator Handle Assembly

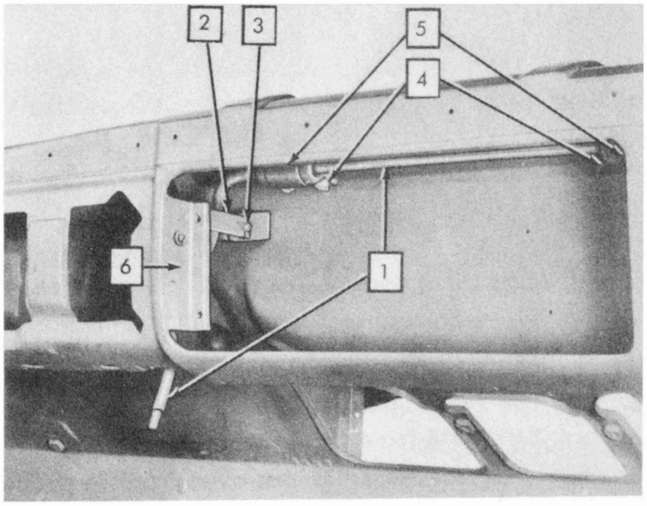
The cowl ventilator handle extends from below the instrument panel (Fig. 69-A). It has two brackets that extend through the dash top to which the cover is fastened (Fig. 69-A). It is held in place by two bushing caps and rubber sealer bushings that are screwed to the dash top. These also serve to seal the openings in the dash top through which the cover brackets are extended.

The ventilator handle bracket assembly (item 2, Fig. 69-A) has a friction clamp under spring ten-



1. Cowl ventilator cover (rubber)
2. Cowl ventilator cover screws
3. Cowl ventilator hood and screen assembly
4. Cowl ventilator hood fastening screws and holes in cowl top (Screws are inserted through holes in cowl top from inside, behind instrument panel)
5. Cowl ventilator drain trough

Figure 69—Cowl Ventilator.



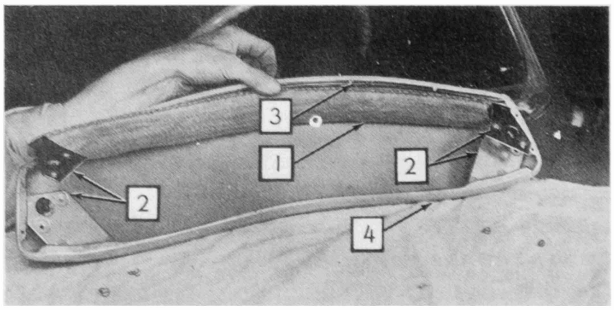
1. Cowl ventilator handle assembly
2. Cowl ventilator handle bracket assembly
3. Cowl ventilator handle bracket clamp clevis pin
4. Bushing cap and screws
5. Bushing (rubber)
6. Radio mounting flanges on instrument panel—left side of center opening

Figure 69-A—Cowl Ventilator Handle Assembly.

sion. This permits the cover to be locked in the full open or closed position, or held in any intermediate position. This bracket also serves as a brace from the instrument panel to the dash panel (item 2, Fig. 69-A).

Cowl Ventilator Hood Assembly

The cowl ventilator hood assembly has two units, of which the hood and grille are one unit, and the ventilator screen the other. The screen is fastened in the hood by retainer clips along the front edge, and by two screws at each end. This allows easy removal of the screen for cleaning and replacement if necessary (Fig. 69-B).



1. Screen assembly
2. Screen fastening plate on screen assembly
3. Retainer clips on hood assembly
4. Hood

Figure 69-B—Removing Cowl Ventilator Screen Assembly from Hood.

The hood assembly is fastened to the cowl top by two cap screws. These are inserted (from inside, behind the instrument panel) through cutouts in the dash top and holes in the cowl top. See Figure 69.

Cowl Ventilator Hood Removal Procedure

1. Remove Weather Eye heat deflector (item 2, Fig. 68).
2. Remove two cap screws holding hood to cowl top. Lift hood from cowl top.
3. Screen assembly can be removed from the hood for cleaning or replacement (Fig. 69-B).
4. Cowl ventilator drain trough can be cleaned if clogged (item 5, Fig. 69).

Cowl Ventilator Cover Removal or Adjustment Procedure

1. Remove cowl ventilator hood assembly.
2. Remove two screws holding rubber cover to ventilator handle and brackets assembly.

Cowl Ventilator Handle Assembly Removal Procedure

1. Remove cowl ventilator cover.
2. Remove radio.
3. Remove ventilator handle assembly (item 2, Fig. 69-A) or remove cotter pin, washer, spring, clevis pin and clamp (item 3, Fig. 69-A).
4. Remove bushing caps holding handle to dash top (item 4, Fig. 69-A).
5. Remove rubber bushing (item 5, Fig. 69-A).
6. Remove ventilator handle (item 1, Fig. 69-A).

To Install, Reverse Removal Procedures

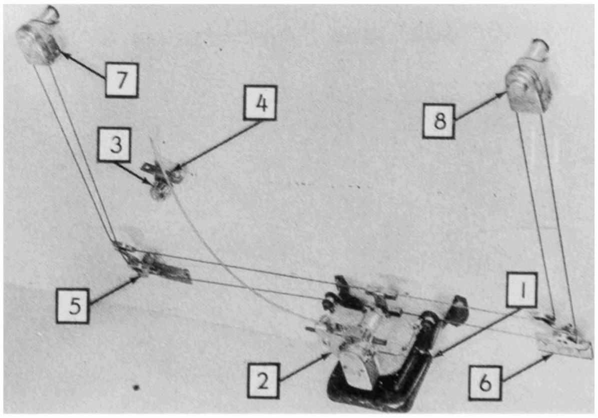
Lubrication

Apply Lubriplate to ventilator handle at bracket and clamp clevis pin (item 3, Fig. 69-A).

Apply graphite on handle and rubber bushing (items 4 and 5, Fig. 69-A).

70. WINDSHIELD WIPER

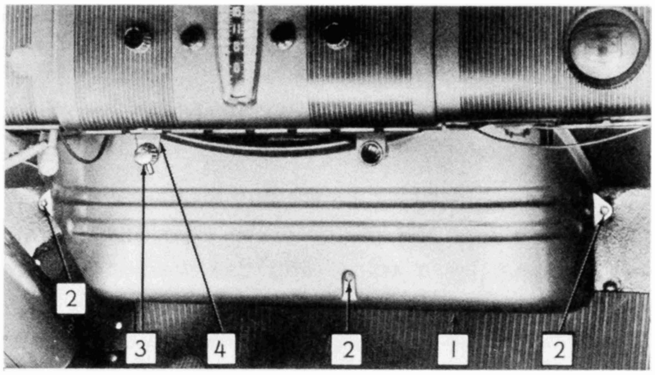
1949 "600" and "Ambassador 6" Series



1. Motor mounting bracket
2. Motor
3. Control
4. Control mounting bracket
5. Cable tensioner—left
6. Cable tensioner—right
7. Pivot shaft body—left
8. Pivot shaft body—right

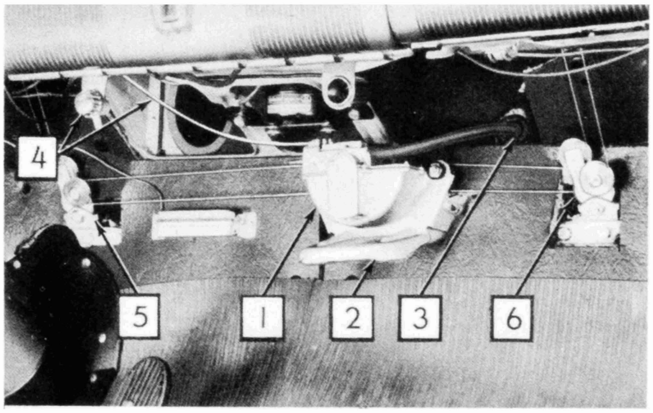
Figure 70—Diagram of Windshield Wiper Layout Inside of Body.

All of the windshield wiper parts inside the body, except the pivot shaft body and cable assemblies, are accessible for service by removing the Weather Eye heat deflector (Figs. 70-A and 70-B).



1. Weather Eye heat deflector
2. Screws, deflector to dash panel (3)
3. Windshield wiper control
4. Control bracket

Figure 70-A—Weather Eye Heat Deflector.

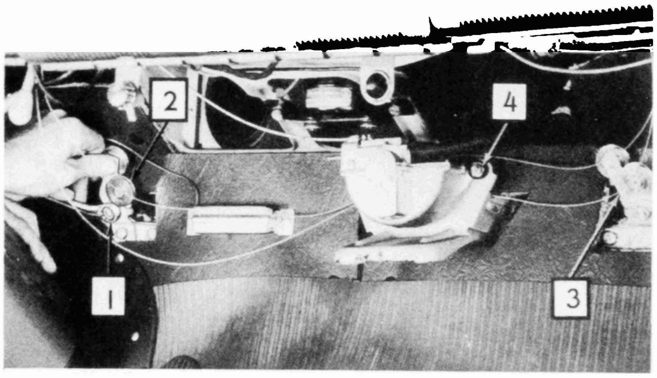


1. Motor
2. Motor mounting bracket (welded to dash panel)
3. Vacuum hose
4. Wiper control
5. Cable tensioner—left
6. Cable tensioner—right

Figure 70-B—Windshield Wiper Parts Exposed after Heat Deflector Is Removed.

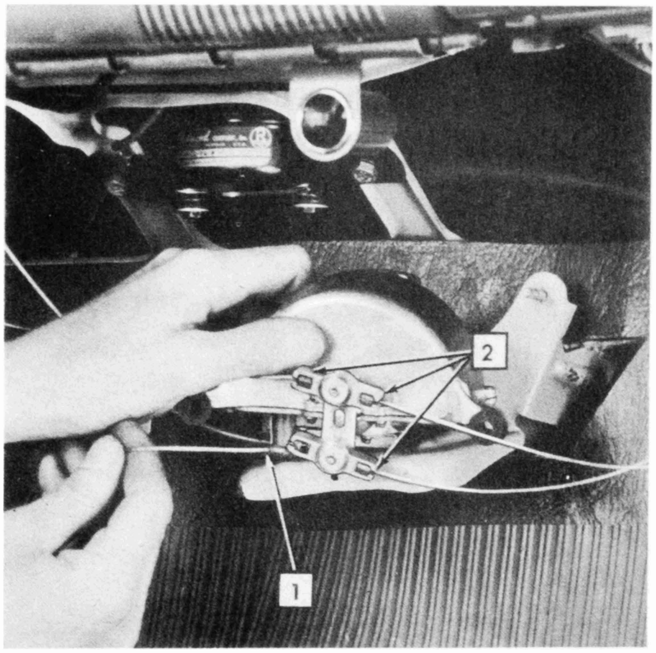
All cables must be loose before any parts of the wiper assembly can be removed. This is accomplished by loosening the lock nut on the tensioners. Then push the tensioners toward the wiper motor while removing the cables from the pulley (Fig. 70-C).

Remove the motor from the bracket by removing the mounting nuts. Turn the motor over, exposing the slots of the cables, for removal of the cable ends (Fig. 70-D).



1. Cable tensioner lock nut loosened
2. Tensioner pulley, pushed toward wiper motor to remove cables from pulley
3. Cables removed from pulley
4. Motor mounting nuts

Figure 70-C—Removing Cables from Cable Tensioner.

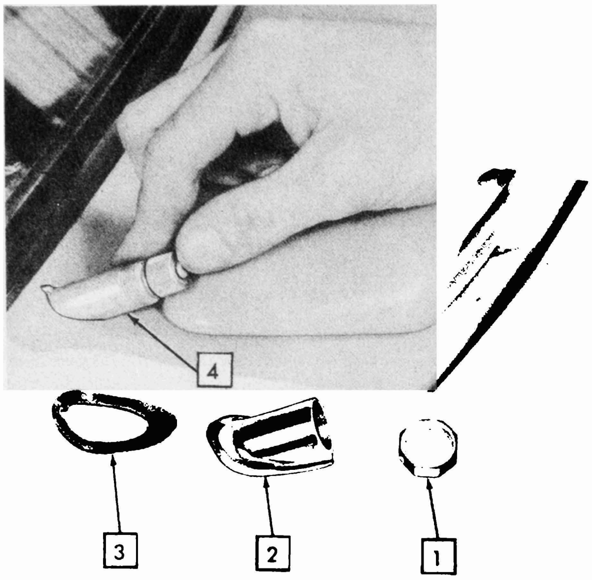


1. Cable end removed from motor
2. Cable ends properly installed to motor

Figure 70-D—Removing Cables from Wiper Motor.

The windshield wiper shaft and the windshield wiper pivot shaft body and cable assemblies are extended through the cowl top from the inside of the body (Fig. 70-F). They are sealed, spaced and tightened on the outside with a leather washer, chrome plated spacer and holding nut. The wiper arms and blades are installed from the outside (Fig. 70-E).

To remove the right or left windshield wiper pivot shaft body and cables from the car, the wiper



1. Pivot shaft nut
2. Pivot shaft spacer
3. Pivot shaft spacer leather washer
4. Pivot shaft body and cables

Figure 70-E—Removing Windshield Wiper Pivot Shaft Body and Cables, Holding Nut, Spacer and Washer.

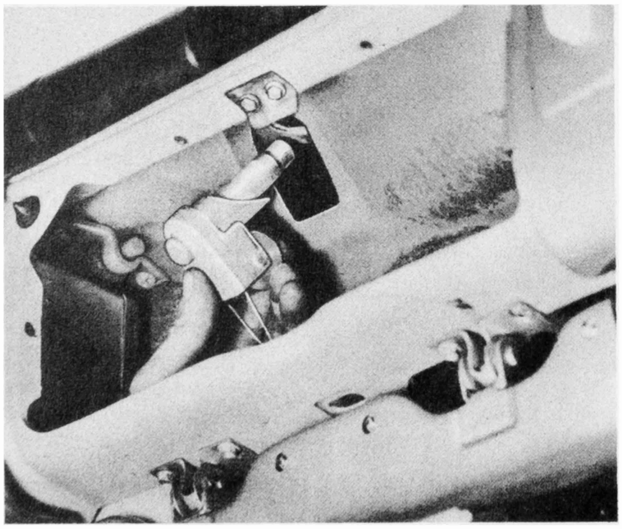


Figure 70-F—Removing Right Windshield Wiper Pivot Shaft Body and Cables from Opening in Dash and Cowl Top, After Glove Box Has Been Removed.

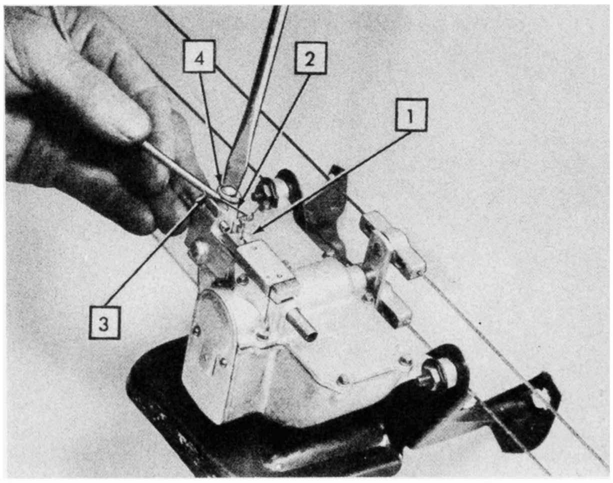
blade, arm, nut, spacer, and washer have to be removed from the shaft.

On the right side it will also be necessary to remove the glove box. See Figure 70-F. On the left side, it will be necessary to remove the left side instrument panel overlay and disconnect the defroster hose from the defroster nozzle (Subject 47).

It is not necessary to remove the windshield wiper control from the instrument panel for removal of the other wiper parts.

> CAUTION: *It is necessary to remove the cable and conduit from the wiper motor.*

The cable end has a small flat washer which is set into a slot in the motor valve control. This is held in place by a screw and flat washer which tightens the conduit into a locking channel of the motor frame (Fig. 70-G). This fastening of the conduit holds the cable in place, yet allows it to work freely in the conduit when the control knob is operated. The motor valve is open when the control knob is turned to the right and closed when it is turned to the left.



1. Motor control valve
2. Control cable
3. Cable conduit
4. Cable conduit lock screw and washer

Figure 70-G—Removing Wiper Control Cable from Motor and Valve.

The control cable should be set into the motor valve control when the control knob is in the closed or off position. The conduit should be moved until the letter "W" on the control knob is in the upright position before the lock screw is tightened.

A by-pass is built into the motor unit, permitting vacuum to enter into an outlet on the left side of the motor for connection to a windshield washer, if the car is so equipped. The washer is controlled by the wiper control knob and cable. When the control knob is turned to the left, the cable pulls the valve on the motor to the left and allows vacuum to pass to the windshield washer. The valve on the motor is under spring tension and must be held in this position until sufficient solution is sprayed on the glass, then the knob must be turned to the right as far as possible to operate the wiper.

The "W" on the control knob is set upright when the motor is off or in the neutral position. The "W" is horizontal to the right when the wiper is on. The "W" is horizontal to the left when the washer is on.

Windshield Wiper Motor Removal Procedure

1. Remove Weather Eye heat deflector (Fig. 70-A).
2. Loosen lock nut on cable tensioners, removing cables from pulleys (Fig. 70-C).
3. Remove two screws holding motor to mounting bracket (Fig. 70-C).
4. Turn motor over and remove cables from motor (Fig. 70-D).
5. Disconnect control cable from motor (Fig. 70-G).

Right Pivot Shaft Body and Cables Removal Procedure—After Wiper Motor Removal

1. Remove glove box (Subject 50).
2. Remove wiper arm and blade.
3. Remove nut, spacer, and washer (Fig. 70-E).
4. Remove pivot shaft body and cables (Fig. 70-F).

Left Pivot Shaft Body and Cables Removal Procedure—After Wiper Motor Removal

1. Remove left side instrument panel overlay (Subject 47), and disconnect defroster hose from nozzle.
2. Remove wiper arm and blade.
3. Remove nut, spacer and washer (Fig. 70-E).
4. Remove pivot shaft, body, and cables (Fig. 70-F).

Left or Right Cable Tensioner Removal Procedure—After Removal of Heat Deflector

1. Loosen lock nut on tensioner. Remove cables from pulleys (Fig. 70-C).
2. Remove two screws holding tensioner to dash (Fig. 70-C).

Windshield Wiper Control Removal Procedure

1. Remove Weather Eye heat deflector (Fig. 70-A).
2. Disconnect cable control from motor (Fig. 70-G).
3. Remove control knob and nut. Lift control from bracket on instrument panel.

To Install, Reverse Removal Procedure
In All Cases

Alignment and Hook up of Pivot Shaft Cables to Motor

NOTE: *The left pivot shaft cables are longer than those on the right (Fig. 70). The outside cable on the left pivot shaft is on the top pulley of the left tensioner. This is hooked to the top motor shaft connection. The inside cable on the right pivot shaft is on the top pulley of the right tensioner. This is hooked to the top motor shaft connection with the outside cable of the left pivot shaft. The other cables are on the bottom pulleys and are hooked to the bottom connection of the motor shaft.*

Setting Tensioners to Tighten Cables

The tensioners are pushed away from the motor until the cables are tight, then the tensioner lock nut is tightened.

CAUTION: *See that cables are free from contact with any other metal surface.*

71. DOME LIGHT

1949 "600" and "Ambassador 6" Series

The dome light consists of two assemblies, the light base and the lens.

The light base assembly, consists of the base reflector and bulb socket. The lens assembly consists of the glass lens mounted into a chrome frame.

The lens chrome frame has four prongs on the inner flange. These prongs fit over four convex projections in the base under spring tension which holds the lens to the base.

Removal Procedure

Insert a putty knife between head-lining and lens chrome frame about one-half inch, then pry frame and glass down and out of the base (Fig. 71).

NOTE: *Do not remove glass lens from chrome frame.*

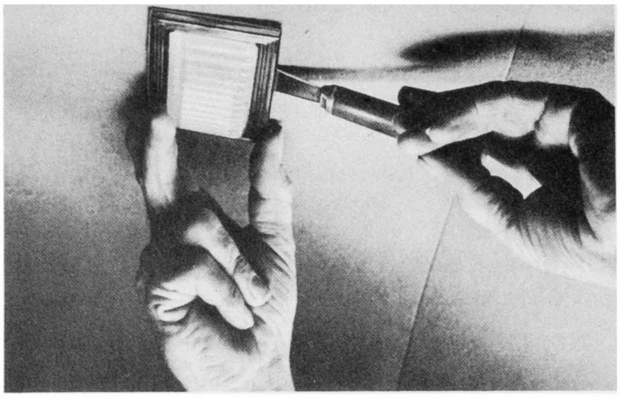
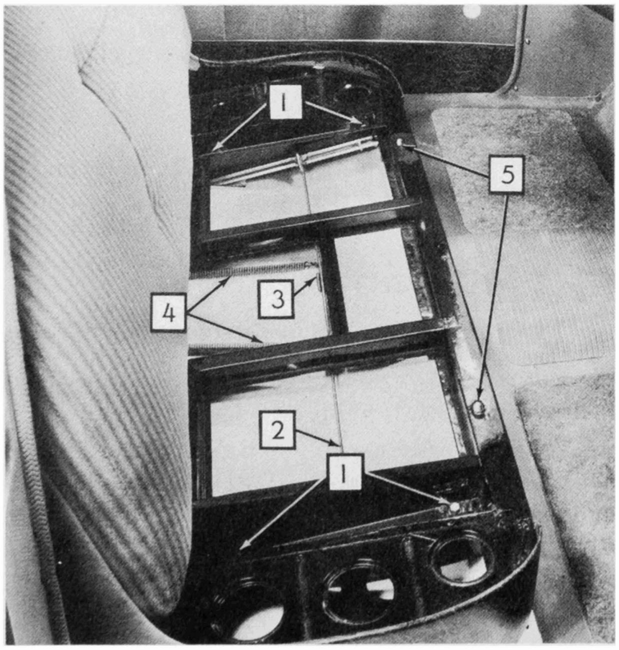


Figure 71—Removing Dome Light Lens.

72. FRONT SEAT FRAME—4 DOOR SEDANS

1949 "600" and "Ambassador 6" Series

The front seat frame includes the seat back, base, and built-in footrest for the rear seat passengers. These are all welded together, forming a complete unit. The base is bolted to the seat adjuster slides and serves as a foundation for the front seat cushion.



1. Seat frame to adjuster nuts
2. Latch wire
3. Latch wire support (on seat)
4. Springs
5. Cushion stop

Figure 72—Front Seat Removal.

> NOTE: *In some models the back of the seat back frame is recessed to form a pocket the full width of the seat. When parts are ordered for seat backs with pockets, this should be noted to obtain the proper parts.*

Removal Procedure

1. Move seat to full forward position.
2. Remove seat cushion.
3. Lift latch wire from support on seat (item 3, Fig. 72).
4. With socket wrench, remove two nuts holding seat frame to seat adjuster slides.
5. Raise seat up from seat adjusters and tilt back to unhook springs from seat base or floor.

To Install, Reverse Removal Procedure

73. FRONT SEAT FRAME—ALL BROUGHAMS AND SEDANS WITH FOLDING SEAT BACKS

1949 "600" and "Ambassador 6" Series

The front seat frame includes the seat base and built-in footrest for the rear seat passengers. These are welded together to form a complete unit. The front seat frame is bolted to the seat adjuster slides and also serves as a foundation for the front seat cushion.

The right and left folding seat backs are mounted to the seat base sides and center brackets. They can be removed from the seat base for service.

74. FRONT SEAT ADJUSTER—ALL MODELS

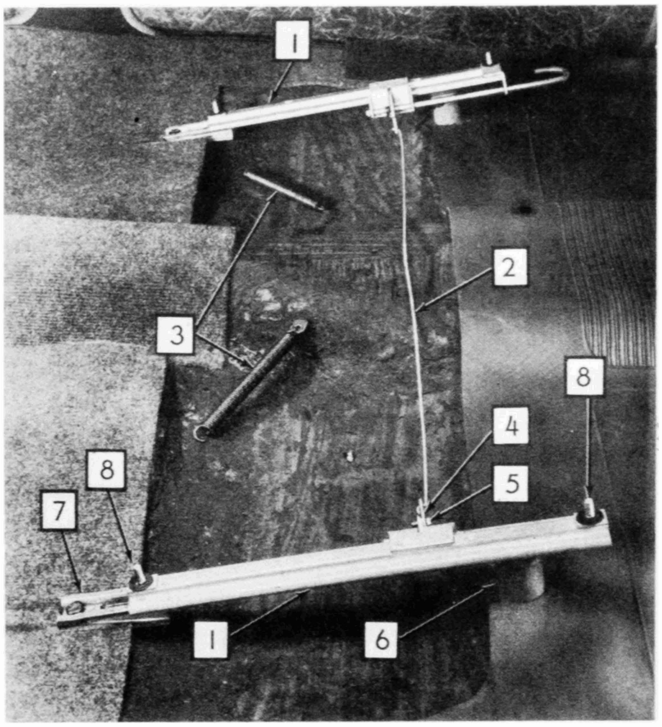
1949 "600" and "Ambassador 6" Series

The front seat adjuster slides have two pieces of channel steel specially formed to provide a race for ball bearings. The top channel is flanged over the bottom to form the union of the two channels, with the ball bearings between them. Sufficient compression is created on the ball bearings to produce constant tension, yet permitting the channels to operate in a sliding action on the ball bearings.

Each adjuster slide has its own latch. The seat may be locked on both sides in the full back position and about every half-inch to the full forward position—a distance of about four inches.

The control handle for releasing the seat latch is on the left adjuster slide. It is connected to the right adjuster slide latch by a latch wire. When properly adjusted, the latches on both adjuster slides operate simultaneously, eliminating side movement of the seat.

Two coil springs are hooked from the body floor to the rear of the seat base to assist in the forward movement of the seat assembly. They also compensate for the natural lift of the seat as it is elevated in forward movement (Fig. 74).



1. Seat adjuster slide—right and left
2. Latch wire
3. Springs
4. Right seat adjuster slide latch (adjustable)
5. Latch lock screw
6. Seat adjuster spacer
7. Seat adjuster to floor screw
8. Fiber insulation washer

Figure 74—Front Seat Adjuster.

Removing Right or Left Adjuster Slides

Removal Procedure

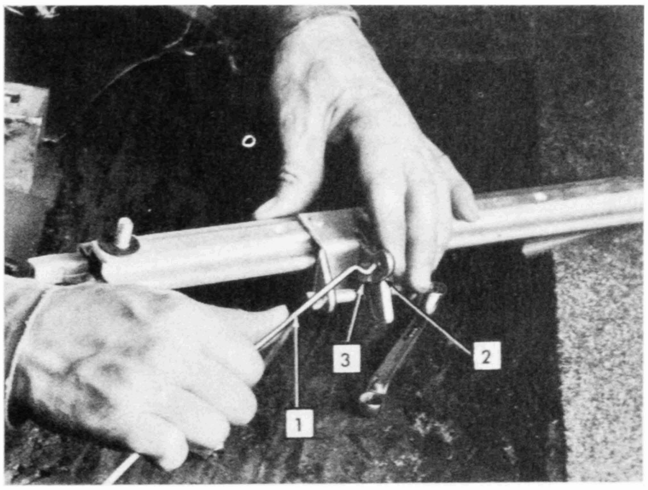
(After seat is removed from adjuster slides. See Figure 72.)

1. Remove rear adjuster slide to floor screw.
2. Slide adjuster to rear and remove front adjuster slide to floor spacer screw.
3. Turn adjuster slide sideways and remove latch wire end from adjuster slide latch.

NOTE: *Fiber washers or insulation pads are placed between the seat adjuster slides and the body floor, also between the seat adjuster slides and the bottom of the seat base. These are to prevent metal to metal contact and possible noise. If these should be misplaced, use cork tape as insulator.*

To Install Right Adjuster Slide

1. Turn adjuster slide sideways and install latch wire as shown in Figure 74-A.
2. Loosen latch screw (item 3, Fig. 74-A).



1. Latch wire
2. Latch
3. Latch lock screw

Figure 74-A—Installing Latch Wire in Latch Right Seat Adjuster Slide.

3. Install screws holding adjuster to floor.
4. Move both seat adjuster slides to the forward position with latch locked in place on each slide.
5. Push latch toward slide and tighten latch lock screw.
6. Operate handle (on left slide) to see if it will release latch on right slide. If not, make closer adjustment.
7. Install seat assembly (Subject 72).

Maintenance

The seat adjuster slides must be kept clean and lubricated for ease in adjusting the seat.

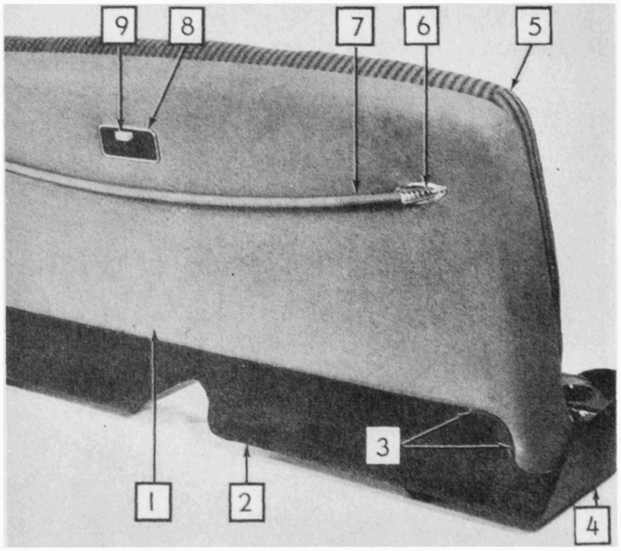
They are cleaned with gasoline, blown dry with air hose, and lubricated with Lubriplate, using a small brush.

75. FRONT SEAT BACK UPHOLSTERY, SPRINGS, KICK PAD AND TRIM PARTS

1949 "600" and "Ambassador 6" Series

The upholstery on the *back of the front seat back* is referred to as the Front Seat Kick Pad (Figs. 75 and 75-A).

The upholstery on the *front of the front seat back* is referred to as Front Seat Back Upholstery (Fig. 75-F).

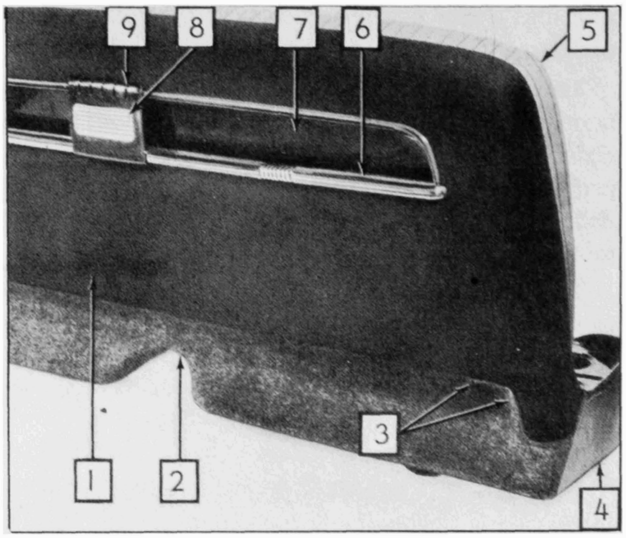


1. Kick pad
2. Toe carpet
3. Drive nails
4. Side wing
5. Front seat back upholstery and spring assembly
6. Robe cord end
7. Robe cord
8. Ash receiver retainer
9. Ash receiver

Figure 75—Front Seat Back (Back of Back).

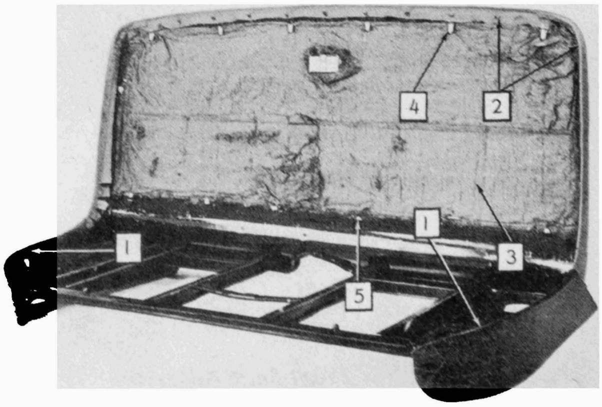
The bottom of the kick pad is clipped to the bottom of the front seat. This is covered by the top of the toe carpet, which is cemented and nailed to the foot rest. The lower side of the kick pad is clipped to the seat side and covered by the side wing, which is screwed to the seat side. The top of the kick pad upholstery is clipped to the top of the seat back and tacked along the sides (Fig. 75-B).

Upon the front seat frame assembly are mounted the kick pad, toe carpet, side wings and hardware trim parts such as robe cord and ash receiver, or pocket trim parts (Fig. 75-C).



1. Kick pad
2. Toe carpet
3. Drive nails
4. Side wing
5. Front seat back upholstery and spring assembly
6. Trim bar—right
7. Trim panel—right
8. Ash receiver
9. Ash receiver retainer

Figure 75-A—Front Seat Back With Trim Panel. (Back of Back).



1. Upholstered side wings
2. Kick pad upholstery (clipped to top and tacked to sides of seat back)
3. Spring padding
4. Clips for holding spring assembly at top
5. Clips for holding spring assembly at bottom

Figure 75-B—Front Seat Frame with Kick Pad Upholstery, Upholstered Side Wings and Spring Padding Installed.

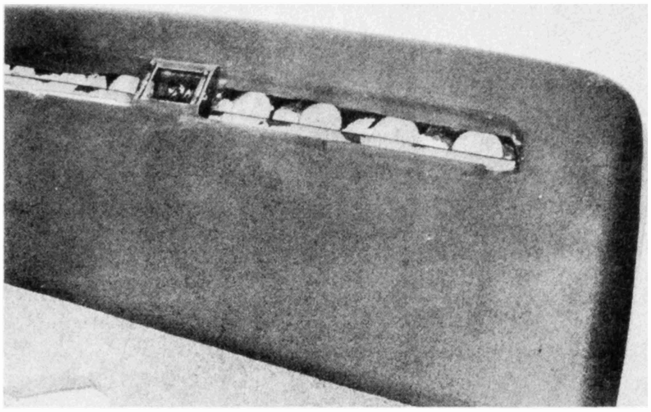


Figure 75-C—Front Seat Kick Pad Cut Out for Trim Parts.

Front Seat Back Trim Parts

The kick pad upholstery is cut out for the ash receiver and trim parts which are fastened to the seat back frame (Figs. 75-C and 75-D).

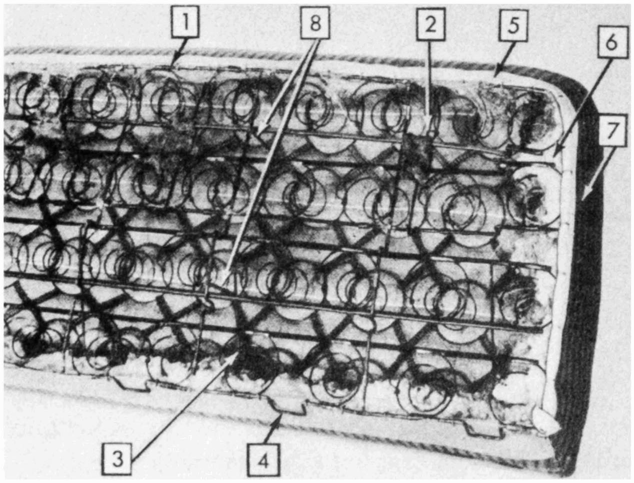
Front Seat Back Upholstery and Springs

The front seat back upholstery and spring assembly consists of springs, spring pad, cotton topper pad and upholstery (Fig. 75-E).

The cotton spring pad (item 5) is sewed to a burlap base and hog-ringed to the spring border wire.

The cotton topper (item 6) is a heavy pad of soft cotton. This is placed over the spring pad with a cloth covering and stitched to the spring pad. Then it is hog-ringed to the spring border wire.

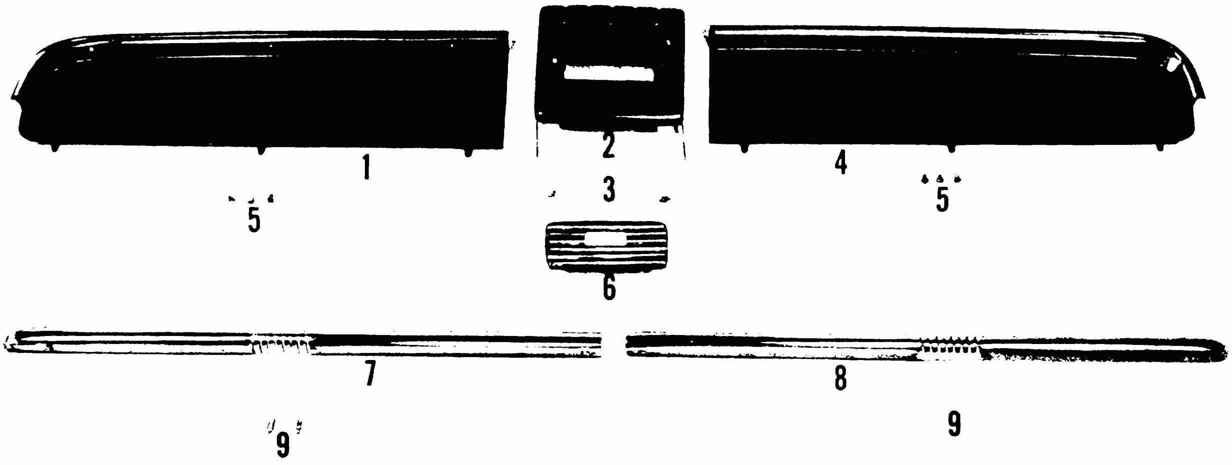
The upholstery (item 7) has a facing sewed to top, bottom and sides, which is hog-ringed to the spring border wire.



1. Spring border wire
2. Diagonal brace wire—upper (4)
3. Diagonal brace wire—lower (5)
4. Loop in border wire for clipping springs to bottom seat frame
5. Spring pad sewed to burlap base and hog-ringed
6. Cotton topper pad
7. Upholstery hog-ringed to spring border wire
8. Button cords hog-ringed to side frame

Figure 75-E—Front Seat Back Upholstery and Springs.

The upholstery buttons and attaching ties (item 8) are inserted through the upholstery pads and springs, then looped over the spring frame and hog-ringed (Figs. 75-F and 75-G).



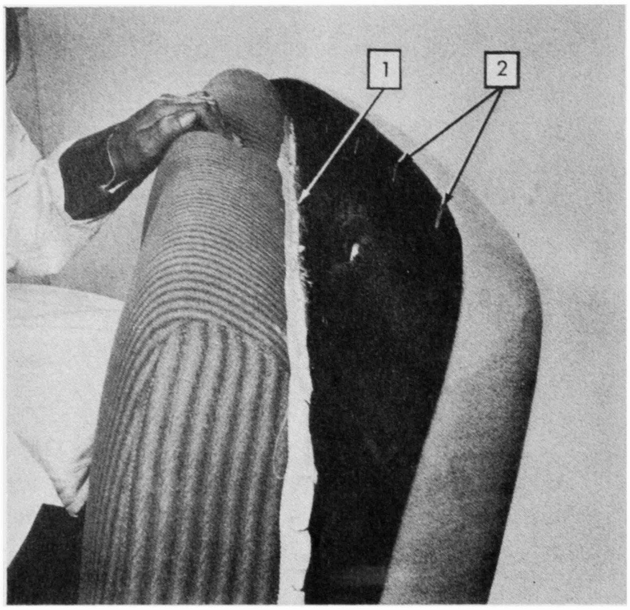
1. Trim panel—left
2. Ash receiver retainer
3. Ash receiver retainer screws
4. Trim panel—right
5. Trim panel screws
6. Ash receiver assembly
7. Trim bar—left
8. Trim bar—right
9. Trim bar screws

Figure 75-D—Front Seat Back Trim Parts.

This complete assembly is installed into the front seat frame assembly as one unit. The front seat frame assembly has spring retaining clips at the top and bottom (Fig. 75-B).

The spring top border wire (item 1) is inserted under the top clips of the seat frame (Fig. 75-F). The bottom clips of the front seat frame are clinched over the spring bottom border wire loops (item 4, Fig. 75-E). This holds the seat back upholstery and spring assembly to the front seat back (Fig. 75-G).

The front seat back upholstery pads and springs are assembled as one unit. Then the unit is installed on the front seat frame as an assembly.



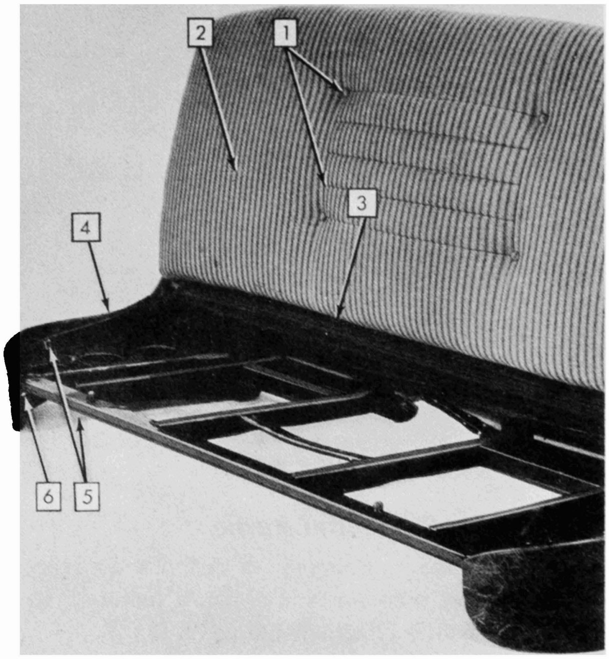
1. Spring top border wire
2. Top clips on seat frame

Figure 75-F—Installing Front Seat Back Upholstery and Spring Assembly in Seat Frame by Hooking Spring Top Border Wire under Top Clips.

No. 1—Front Seat Back Upholstery and Spring Assembly

Removal Procedure

1. Remove front seat cushion.
2. Loosen clips holding bottom border wire (item 3, Fig. 75-G).
3. Pull bottom of upholstery and spring assembly from seat frame and push down, releasing top border wire from top clips (Fig. 75-F). If the top clips are bent out, they should be straightened to hold the springs when they are reinstalled.



1. Buttons and cords
2. Seat back upholstery and spring assembly
3. Clips holding spring assembly at bottom of seat frame
4. Side wing
5. Side wing clip
6. Side wing screw

Figure 75-G—Front Seat Back (Front of Back).

No. 2—Front Seat Back Upholstery

Removal Procedure—After Removal Procedure No. 1

1. Cut and remove hog rings holding upholstery facing to spring border wire (item 7, Fig. 75-E).

No. 3—Front Seat Back Spring

Removal Procedure—After Removal Procedures No. 1 and No. 2

1. Cut and remove hog rings holding burlap spring pad base to spring border wire (item 5, Fig. 75-E).

To Install, Reverse Removal Procedure

No. 4—Front Seat Side Wing Upholstery

Removal Procedure

1. Remove front seat cushion.
2. Remove screw at front of side wing to seat frame (item 6, Fig. 75-G). Bend bottom clips down and slide side wing assembly forward from seat frame side.
3. Remove upholstery from side wing panel.

To Install

4. Cement upholstery to side wing panel (use trim cement). Slide wing on seat frame side. Install screw at front and tighten all clips.

No. 5—Front Seat Kickpad

Removal Procedure—No. 5, after Removal Procedures No. 1 and No. 4, Both Sides.

1. Remove trim parts from front seat back (Figs. 75 and 75-A).
2. Loosen top of toe carpet (Figs. 75 and 75-A) and unhook upholstery from clips.
3. Remove tacks on sides and unhook upholstery from clips on top of seat back frame (Fig. 75-B).

No. 6—Front Seat Back Toe Carpet

Removal Procedure—No. 6

1. Remove front seat cushion.
2. Remove front seat assembly from seat adjusters (Subject 72).
3. Tilt seat back forward. Remove drive nails from top of toe carpet and open channel at bottom, releasing carpet. (The carpet is cemented to the foot rest panel with trim cement.)

To Install, Reverse Removal Procedure

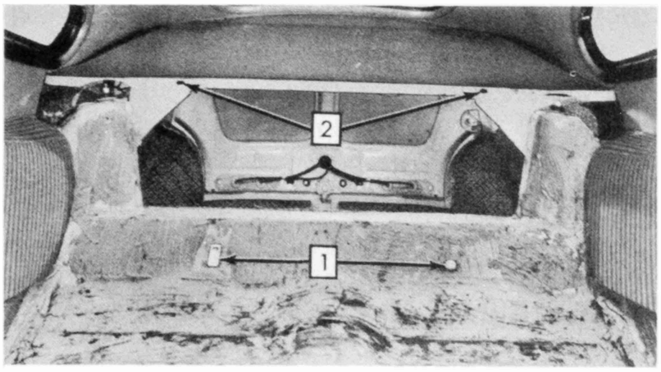
76. REAR SEAT BACK

1949 "600" and "Ambassador 6" Series

The rear seat back assembly consists of spring, spring pad, cotton topper pad and upholstery on the front of the spring. The rear of the spring is covered with a printed insulation pad which is exposed to the trunk compartment. The rear of the spring is also upholstered with a trim panel across the back of the seat above the rear window shelf.

The rear seat back springs are provided with a "U" steel channel. Pressed paper crimped into this channel serves as a tacking rail for the top and upper half of the sides. The lower half of the sides and bottom have a round spring border wire for hog-ringing this portion of the upholstery and back insulation pad.

The bottom border wire of the spring assembly is clipped to the body floor. There are two studs on the seat back spring which are inserted through holes in the flange of the rear window shelf. Lock washers and nuts are installed on these studs from the trunk compartment.



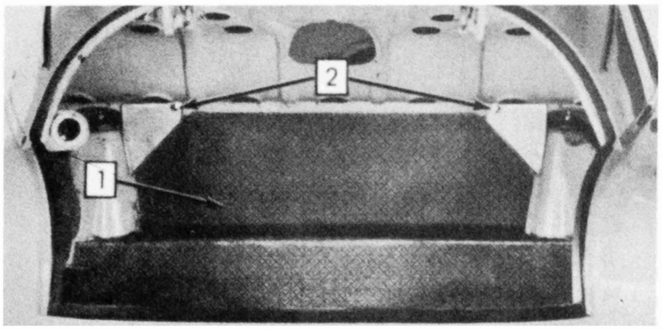
1. Clips on body floor
2. Holes in flange of rear window shelf panel

Figure 76—Rear Seat Back Fastening Clips on Body Floor and Holes in Flange of Rear Shelf for Fastening Studs on Seat Back Spring Assembly.

No. 1—Rear Seat Back and Spring Assembly

Removal Procedure—No. 1

1. Remove nuts and lock washers through trunk compartment (Fig. 76-A).



1. Rear seat back assembly
2. Studs from seat back

Figure 76-A—Rear Seat Back Assembly Bolted to Flange on Rear Window Shelf in Trunk Compartment.

2. Remove rear seat cushion from inside body.
3. Pull top of seat back from rear window shelf until studs are released.
4. Lift seat back upward, releasing seat back from clips at bottom.

To Install, Reverse Removal Procedure

No. 2—Rear Seat Back Upholstery

Removal Procedure—No. 2, After No. 1

1. Remove trim panel tacked to top on back of seat.

2. Remove printed insulation pad. (Cut hog rings and remove tacks.)
3. Remove upholstery. (Cut hog rings and remove tacks.)

No. 3—Rear Seat Back Springs

Removal Procedure No. 3, After No. 1 and No. 2

1. Remove combination spring and topper pad. (Cut hog rings and remove tacks.)

77. SEAT CUSHIONS

1949 "600" and "Ambassador 6" Series

In production three different types of springs and two different types of pads are used. All springs, however, are provided with a spring grille pad.

Types of Springs

Conventional springs have four rows of coils.

Semi-Luxury springs have five rows of coils, with the second and third rows encased.

Full Luxury, or heavy duty, springs have six rows of coils, with all coils encased.

Types of Pads

The cotton pads are a combination of a spring pad and a cotton topper pad stitched together. The spring pad has a burlap base and the topper pad has a cloth covering. The two pads, being stitched together and hog-ringed to the spring border wire, provide a good base and a smooth surface for the upholstery.

The latex foam pads have a cloth pad skirt for tacking to the spring tacking rail (Fig. 77).

No. 1—Seat Cushion Upholstery

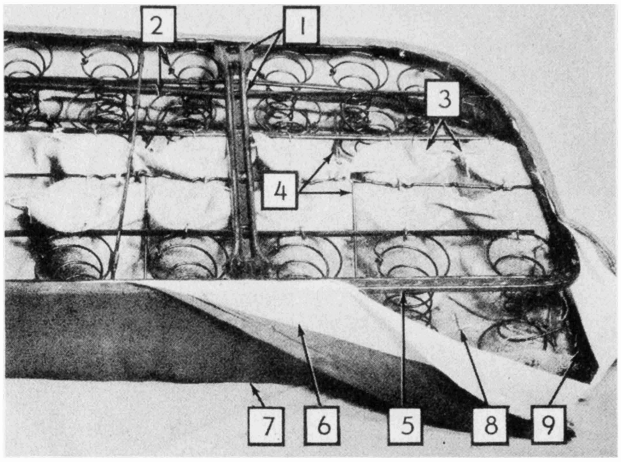
Removal Procedure

1. Remove cushion from car and place on clean cloth or bench.
2. Remove tacks holding upholstery to tacking rail.
3. Remove buttons, if so equipped.

No. 2—Cushion Spring

Removal Procedure—After Removal Procedure No. 1

1. Remove tacks from pad skirt.
2. Cut hog rings and remove spring border wire pad.
3. Cut hog rings and remove spring pad grille.



1. Cushion support and stop
2. Conventional coils
3. Semi-Luxury encased coils
4. Diagonal brace wire
5. Tacking rail
6. Pad skirt (foam pad)
7. Cushion facing
8. Pad grille
9. Spring border wire

Figure 77—Removing and Installing Front Seat Cushion Upholstery.

To Install, Reverse Removal Procedure

NOTE: *When installing new springs, inspect and tighten all coil and diagonal brace wire clips. If necessary, install "C" clips over diagonal brace wire ends and border wires.*

Rough handling of springs in shipment for service replacement often loosens the clips, causing failure.

Front Seat Cushion

The front seat cushion should be set on the seat back base, then pushed back into place by applying pressure on the bottom tacking rail.

> CAUTION: *Do not apply pressure or pound on the top front border. This will loosen the diagonal brace wire anchorage, causing the front edge to collapse and the end of the diagonal brace wire to damage the pad and upholstery.*

Rear Seat Cushion

Place the cushion stops on the inside edge of the cushion support, then push the back of the cushion down against the seat. (See caution above.)

78. REPLACING DAMAGED UPHOLSTERY BY SECTIONS

1949 "600" and "Ambassador 6" Series

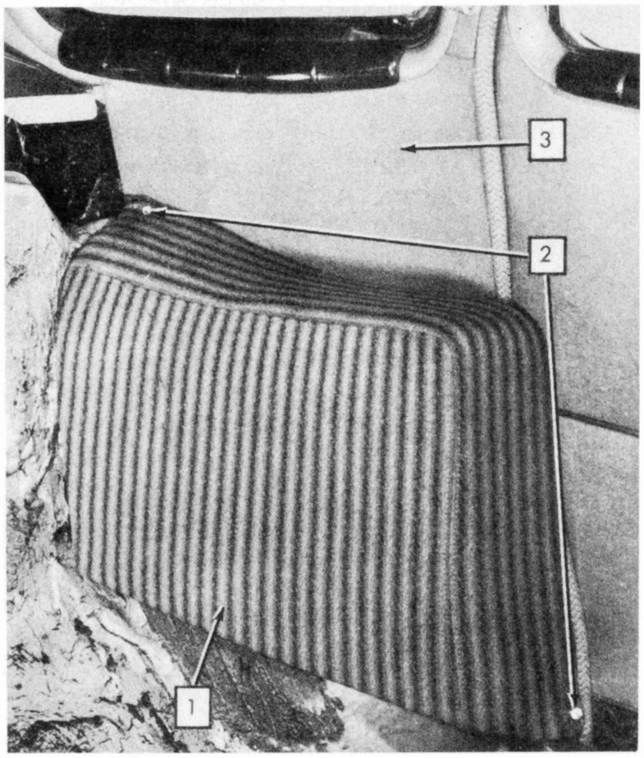
Torn, burned or stained upholstery on seat cushions and backs, may be repaired by replacing the section of upholstery damaged and not the complete new cushion and back upholstery.

The body section of the Parts Book lists the various sections of upholstery serviced.

Refer to ORDERING BODY PARTS, Subject No. 2.

79. REAR QUARTER SIDE ARM REST AND TRIM PANEL

1949 "600" and "Ambassador 6" Series



1. Side arm rest
2. Side arm rest screw
3. Trim panel

Figure 79—Rear Quarter Side Arm Rest and Trim Panel.

The rear quarter side arm rest is molded ragboard with a steel reinforcing plate. There are two prongs on the front edge of the arm rest which set into the rear quarter body pillar (Fig. 79-A). There are two more prongs at the rear lower portion of the arm rest. They support the arm rest on the rear quarter side panel.

Two screws, one at the upper rear corner and one at the lower front corner fasten the arm rest to the body (item 2, Fig. 79).

The rear quarter trim panel (item 3, Fig. 79) is separate from the arm rest and can be removed without removing the arm rest.

No. 1—Rear Quarter Side Arm Rest

Removal Procedure

1. Remove rear seat cushion.
2. Remove rear seat back (Subject 76).
3. Remove two screws holding arm rest to side quarter panel (item 2, Fig. 79).

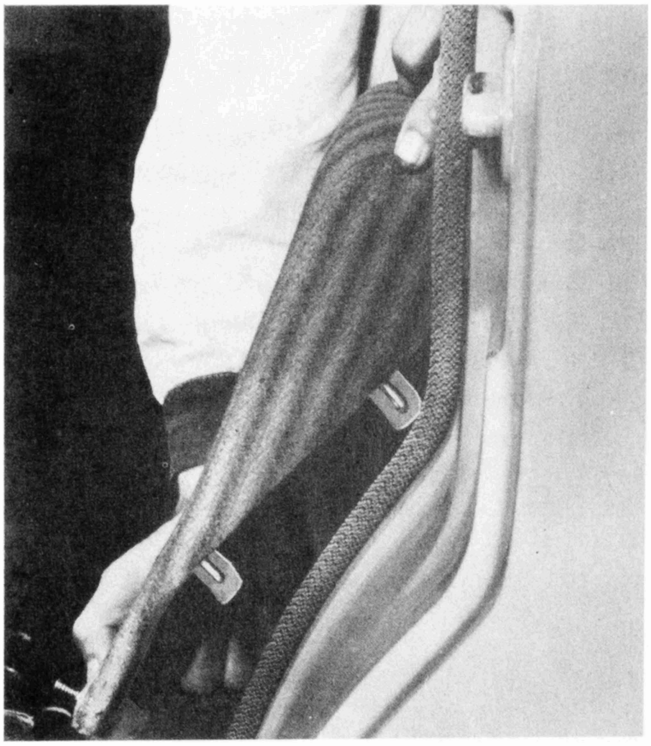


Figure 79-A—Removing Rear Quarter Side Arm Rest.

4. Pull lower front edge of arm rest away from rear quarter body pillar and raise up, releasing front clips. This movement lowers the back end, releasing the rear clip (Fig. 79-A).

No. 2—Trim Panel

Removal Procedure

1. Remove rear quarter ventilator assembly (Subject 33).
2. Remove rear seat back (Subject 76).
3. Remove upper rear screw arm rest to body (item 2, Fig. 79).

4. Lift trim panel up from arm rest.

To Install, Reverse Removal Procedure

No. 3—Rear Quarter Arm Rest and Trim Panel

Removal Procedure—After Removal Procedure No. 1

1. Remove rear quarter ventilator assembly (Subject 33).

80. HEADLINING

1949 "600" and "Ambassador 6" Series

No. 1—Removing Parts for Headlining Removal

Removal Procedure

1. Remove sun visors.
2. Remove rear view mirror (Fig. 80).
3. Remove instrument panel top overlay (Subject 46).
4. Remove defroster outlet caps.
5. Remove finish molding, right and left.
6. Remove rear quarter ventilators (Subject 33) or finish molding if on broughams.
7. Remove assist cords or hand ropes.
8. Remove dome and reading light lenses and bases (Subject 71).
9. Remove rear seat cushion.
10. Remove rear seat back (Subject 76).
11. Remove rear window finish molding.
12. Remove rear window shelf panel trim panel.

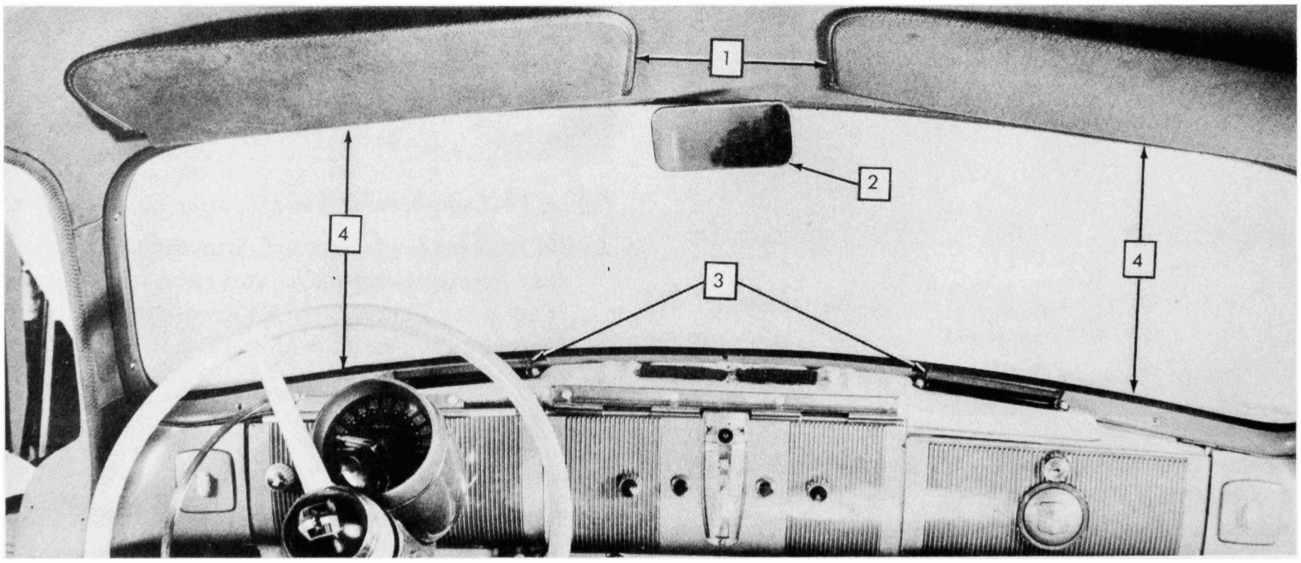
No. 2—Removing Headlining from Body

Removal Procedure

1. Pull headlining loose around windows where it is cemented. Remove tacks from headlining at shelf panel sides and under rear window.
2. Remove tacks from headlining at top of windshield.
3. Loosen headlining at front of retainer strip. With dull putty knife unhook the headlining from the saw teeth of the retainer strip as shown (Fig. 80-A).
4. With edges of headlining loose at front, rear, and both sides, push front headlining listing bow back. This will allow the arch to swing down. Now spring each end of listing bow from socket in body side roof rail, as shown in Figure 80-B. Follow the same procedure for each bow, removing headlining with bows remaining in listings.

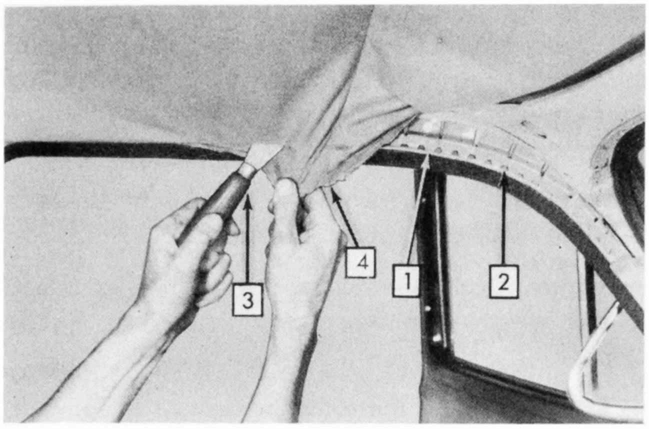
NOTE: *These bows are of different lengths and should be left in the headlining.*

If a new headlining is installed, the old headlining should be placed beside the new headlining and the bows transferred to their proper listings.



1. Sun visors, right and left
2. Rear view mirror
3. Defroster outlet caps
4. Finish molding

Figure 80—Parts to be Removed at Windshield for Headlining Removal.



1. Headlining retainer
2. Saw teeth on inside of retainer (next to body)
3. Lifting headlining off saw teeth of retainer
4. Pulling headlining down as it is released from saw teeth

Figure 80-A—Removing Headlining from Retainer.

No. 3—Installing Headlining in Body

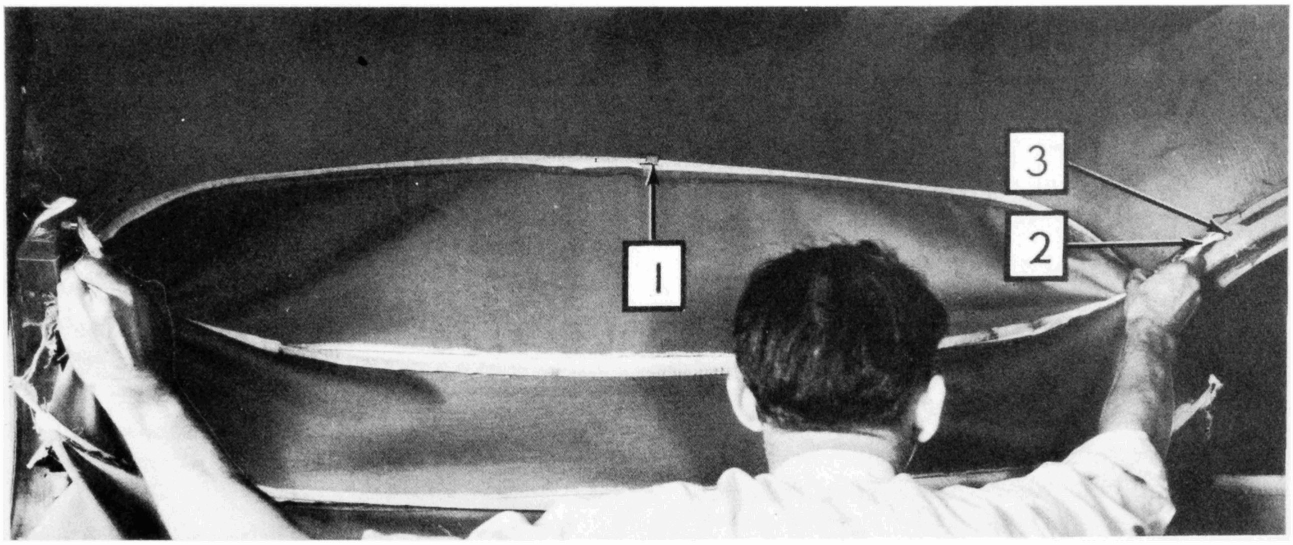
Installation Procedure

1. Before installing headlining, inspect sawtooth points of the headlining metal retaining strip. If bent, remove and straighten.
2. Start at rear of body with arch of bow down. Install ends of bow in sockets of side roof rail, swinging bow back and up against the roof. Now fasten bow into clip at top of dome light bracket (item 1, Fig. 80-B). Follow same procedure on remaining bows, spacing headlining evenly at each side while installing bows.
3. Spread rubber cement on ledge of rear window, and rear quarter windows, using an upholstery cement.
4. Stretch headlining forward, and tack it to windshield opening ledge.
5. At rear of body, stretch headlining, tacking below rear window at tacking strip on rear seat back shelf.
6. Cut rear window opening in headlining, and cement to rear window ledge and to rear quarter window ledges.
7. Stretch headlining lightly and force it under metal retaining strip with a dull putty knife, on each side of the body. Start at rear listing and work to front on each listing, then between listings.
8. Cut headlining opening for reading light, and install reading light base and lens.
9. **To Install Parts Removed, Reverse Removal Procedure No. 1.**
10. Brush and clean headlining.

82. CLEANING UPHOLSTERY

1949 "600" and "Ambassador 6" Series

There are a few items of a general nature to bear in mind when cleaning upholstery fabrics. On seat



1. Rear bow and listing fastening clip
2. Bow end and listing
3. Socket in main roof rail for bow

Figure 80-B—Removing and Installing Headlining Listing Bows at Side Roof Rails.

cushions and seat backs, do not saturate so that pads become wet.

In removing spots from a headlining, do not rub against the nap. Should this happen, smooth the material by rubbing with the nap while cloth is damp.

CAUTION: *Do not push headlining against the roof insulation, as this may further stain headlining.*

On upholstery which is backed with ragboard, be careful not to wet the cloth so that the ragboard stains trim material.

Type of Upholstery: When cleaning, removing spots, or renovating upholstery, it is necessary to know the type of fabric used. There are two types of upholstery used in automobiles—flat fabrics, which include broadcloth, whip cord and leather, and mohair fabrics, which are pile fabrics.

A flat fabric is one that is woven so that the fibres lie flat, the sides of the many fibres forming the wearing surface. A pile fabric is woven so that the fibres stand erect. These ends form the wearing surface of the material.

Removing Stains: The following suggestions will be helpful in removing stains.

NOTE: *When using cleaning fluids, always follow the procedure that is commonly used in cleaning clothes. Dampen a clean cloth with the fluid and start rubbing lightly around the OUTSIDE of the spot, gradually working to the center. This method keeps the spot from spreading and is less likely to leave a ring.*

Battery Acid: Pour household ammonia directly on the spot and allow it to remain for one minute. Rinse with cold water. It is essential that such treatment be applied at once, as the acid will eat the fabric within a few hours.

Grease and Oil Stains: Use Nash Fabric Cleaner. If the fabric is saturated with oil, pour cleaning fluid on the spot then soak it up by pressing a white blotter on the spot. Do this before cleaning with a cloth dampened with the cleaning fluid.

Blood Stains: Use cold water. If this does not remove the entire stain, pour ammonia on spot, then rub with a clean cloth.

NOTE: *Never use hot water on a blood stain, as this will only set the stain.*

Candy Stains: Use hot water on all candy stains that do not contain chocolate. If a chocolate stain, first rub out the stain with a clean cloth dampened with Nash Fabric Cleaner. Then scrape with a dull knife and rinse with cold water. In either case, after the spot has dried, it is advisable to finish the job by using Nash Fabric Cleaner.

CAUTION: *Avoid the use of hot water except where specifically recommended.*

Fruit Stains: Rub vigorously with a cloth dampened in hot water, and when dry use Nash Fabric Cleaner.

Ice Cream: Follow the same procedure as for fruit stains.

Lipstick: Pour a small quantity of Nash Fabric Cleaner directly on the spot. Press a clean white blotter over the stain. Repeat this process, using a new blotter each time until no stain remains.

Nausea Stains: Use warm soapsuds. Sponge the stained area until stain is removed. Brush with a whisk broom, with the fiber pile when wet and against the pile when dry.

Milk Stains: Follow the same procedure as for nausea stains.

Water Spots: Sponge the entire panel with a cloth dampened with cold water, and then sponge the spots with Nash Fabric Cleaner.

Chewing Gum: Moisten the gum with Nash Fabric Cleaner. Remove with a dull knife, and then finish with Nash Fabric Cleaner.

Renovating Mohair Upholstery: If the car is trimmed with mohair upholstery, the fabric pile may, after a long period of time, become slightly flattened or "shiny." If this happens, restore the pile in the following manner:

Dampen a clean cloth and spread it over the pressed down portion of the upholstery. Then press a hot iron over the cloth lightly. This will drive the steam into the core of the resilient fibres and cause them to spring erect. Should the pile be crushed down badly, it may be necessary to repeat this several times.

83. CLEANING LEATHER

1949 "600" and "Ambassador 6" Series

The cause of stickiness and loss of luster on leather upholstery is due largely to the use of polishes or cleaning preparations which injure the surface finish. To maintain a bright and clean finish on leather upholstery, we suggest the following method:

Apply damp (not wet) cloth with Castile soap and rub the surface of the leather briskly. Next, apply a moist cloth without soap. Finish by rubbing dry with a clean soft cloth. The gloss finish of the leather may disappear during the first operation. However, it will be restored by the friction produced by the dry cloth.

Under no circumstances, use furniture polishes, oils or varnishes on leather upholstery.

84. CLEANING RUG MATERIAL

1949 "600" and "Ambassador 6" Series

Rug material occasionally requires cleaning, which may be done with a whisk broom or vacuum cleaner.

NOTE: *In some cases the pile of the rug material is set into a rubber base, and any fabric cleaner or gasoline may serve as a solvent which will cause the pile to be loosened and come out.*

Removing Spots

Use Ivory soap suds with a sponge, wiping off the suds with a dampened sponge. Do not use an excessive amount of water. When dry, brush with a whisk broom.

85. GLASS—CARE AND HANDLING

1949 "600" and "Ambassador 6" Series

Cleaning Glass

Clean windshields and windows promote safety and comfort in driving. However, care in cleaning should be exercised.

Do not clean glass with a chamois or cloth which has been used to wash the car or has collected dirt and fine grit or sand. Such foreign materials will cause fine scratches in the glass, and in some cases may obstruct the vision.

Glass Breakage

Care should also be exercised to prevent glass breakage. Avoid the use of any object which may cause chipping or breakage if it comes in contact with the edge of the glass.

Signs and Labels

Certain adhesive materials used for pasting signs or labels on the glass cannot be removed without causing pits in the glass.

86. CHROME PLATED PARTS

1949 "600" and "Ambassador 6" Series

Chrome plated parts should be wiped occasionally with a cloth dampened with light oil or kerosene. Rust spots or tarnish on chrome can be removed with Nash Chrome Cleaner.

87. STAINLESS STEEL PARTS

1949 "600" and "Ambassador 6" Series

Stainless steel parts, such as body belt and lower moldings, rear window and windshield reveal moldings, should be cleaned with Nash Chrome Cleaner. Under certain conditions of operation, a corrosion may develop on the stainless steel parts that will, if allowed to go without an occasional cleaning, make the parts appear rusted.

88. PAINT—CARE OF FINISH

1949 "600" and "Ambassador 6" Series

Nash-built cars have baked enamel finish on body, hood, fenders, and all sheet metal parts. This finish is exceptionally durable and gives a beautiful high gloss. Under ordinary conditions, the finish will require but little attention to preserve it for a long period.

Washing

To avoid scratching the finish, the car should be washed, rather than cleaned with a dry cloth. Wash the car only when it is out of the rays of the sun, and after the metal surface has been allowed to cool. Use cold water and dry with a clean chamois.

Polishing

While this type of finish will maintain high gloss for a long period, it will be necessary at certain intervals, depending entirely on the climatic conditions to which the car is exposed, to clean the finish in a more thorough manner than is possible by washing. When the surface film, which will naturally accumulate, cannot be removed by washing, the finish should be cleaned with Nash Liquid

Polish and Cleaner. Rub sufficiently to clean the surface thoroughly and follow with a brisk circular motion with a soft dry cloth.

Waxing and Polishing

Where the finish of a car has been neglected and has oxidized through weathering, use Nash Cleaner and Polish. This will remove the road film and restore the finish to a long-lasting, high gloss.

On cars that have been touched up, or have had sections refinished in repair lacquer, it may be necessary to use a paste cleaner on these repaired parts to remove the traffic film. Where paste cleaner is used on lacquered parts, always follow with Nash Liquid Polish to produce a hard dry surface and high luster.

CAUTION: *Do not use paste cleaner or wax on Baked Enamel finished cars.*

Use Nash Liquid Polish and Cleaner.

Rust

The body and other sheet metal parts are protected from the action of rust by a "Bonderizing" process. Where the paint finish is damaged in such a way that bare metal is exposed, the "Bonderizing" prevents the spread of rust to a greater area. It is, however, to the advantage of the car owner to have any such damage properly repaired. For this reason, a special line of paint materials has been developed for repairing damage to this type of finish.

This material is Air Dry Enamel. It is comparable to Bake Type Enamel in producing a high gloss, glass-like finish. Properly maintained with Nash Liquid Polish it produces an appearance more nearly comparable to baked enamel than that produced by any other repair material.

Road Tar or Oil

The use of a good standard brand of tar remover will remove oil or tar without injury to the finish. However, if the tar has hardened, use gasoline, which does not contain coloring matter or Ethyl fluid. After removing the tar, it is advisable to apply Nash Cleaner and Polish.

Salt Air

A little extra attention should be given to cars operated near the seashore. The body and sheet metal should be polished carefully every three months. Chrome plating should also be cleaned at the same time.

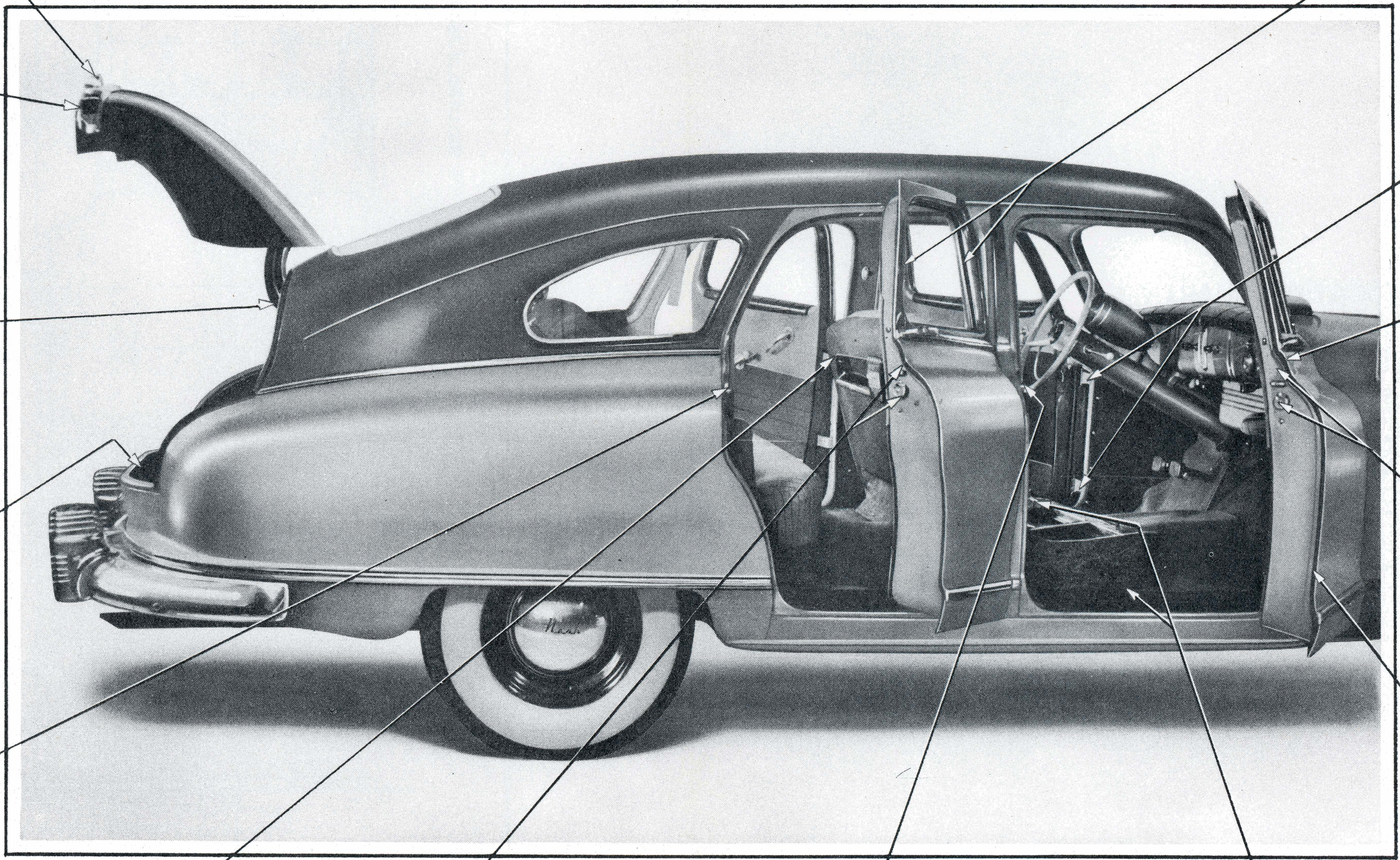
89. BODY LUBRICATION CHART

1949 "600" and "Ambassador 6" Series

Nash

1949 "600" AND "AMBASSADOR 6" SERIES

BODY LUBRICATION CHART



DECK COVER KEY LOCK HANDLE

Subject No. 61

Use finely powdered graphite.

DECK COVER LOCK

Subject No. 62

Use motor oil in lock mechanism and Lubriplate on lock bolt.

DECK COVER CONCEALED HINGES

Subject No. 65

Use Lubriplate on spring, pin, and all points of friction. Apply with small brush.

DECK COVER LOCK STRIKER

Subject No. 63

Apply thin film of Lubriplate on bottom side of striker.

REAR QUARTER BODY PILLAR LOCK STRIKER AND MALE DOVETAIL

Subject No. 40

Apply thin film of Lubriplate to both sides of lock striker. Do *not* use wax lubricant.

DOOR CHECKS—OR HINGE SPRINGS

Subject No. 35

Apply Lubriplate to contact points of spring to hinge shaft and base.

REAR DOOR LOCK AND ROTOR

Subject No. 22—Figure 22-C

Use light oil in 3 holes above rotor for lock mechanism and cams. Use Lubriplate on rotor.

CENTER BODY PILLAR LOCK STRIKER AND MALE DOVETAIL

Subject No. 40

Apply thin film of Lubriplate to both sides of lock striker. Do *not* use wax lubricant.

SEAT ADJUSTER SLIDES

Subject No. 74

Apply Lubriplate to interior of slides at each end and latch. Use small brush.

GLASS CHANNELS

Subject No. 29

Use flake graphite only—do not use oil or wax.

DOOR HINGES

Subject No. 39

Spiral grooved hinge pins are prelubricated. See Subject 39.

FRONT DOOR KEY LOCKS

Subject No. 13

Use finely powdered graphite.

FRONT DOOR LOCKS

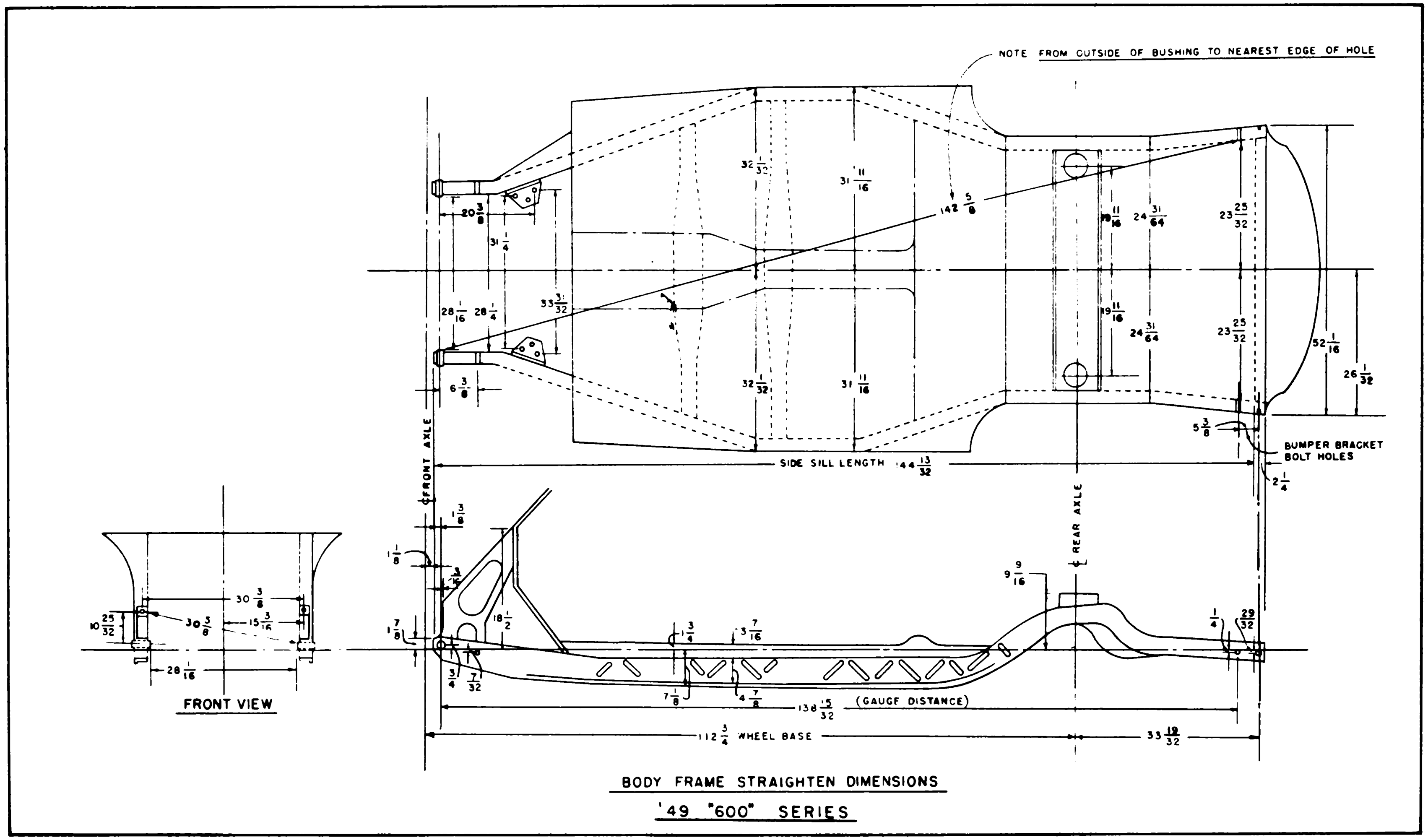
Subject No. 22—Figure 22-C

Use light oil in 3 holes above rotor for lock mechanism and cams. Use Lubriplate on rotor.

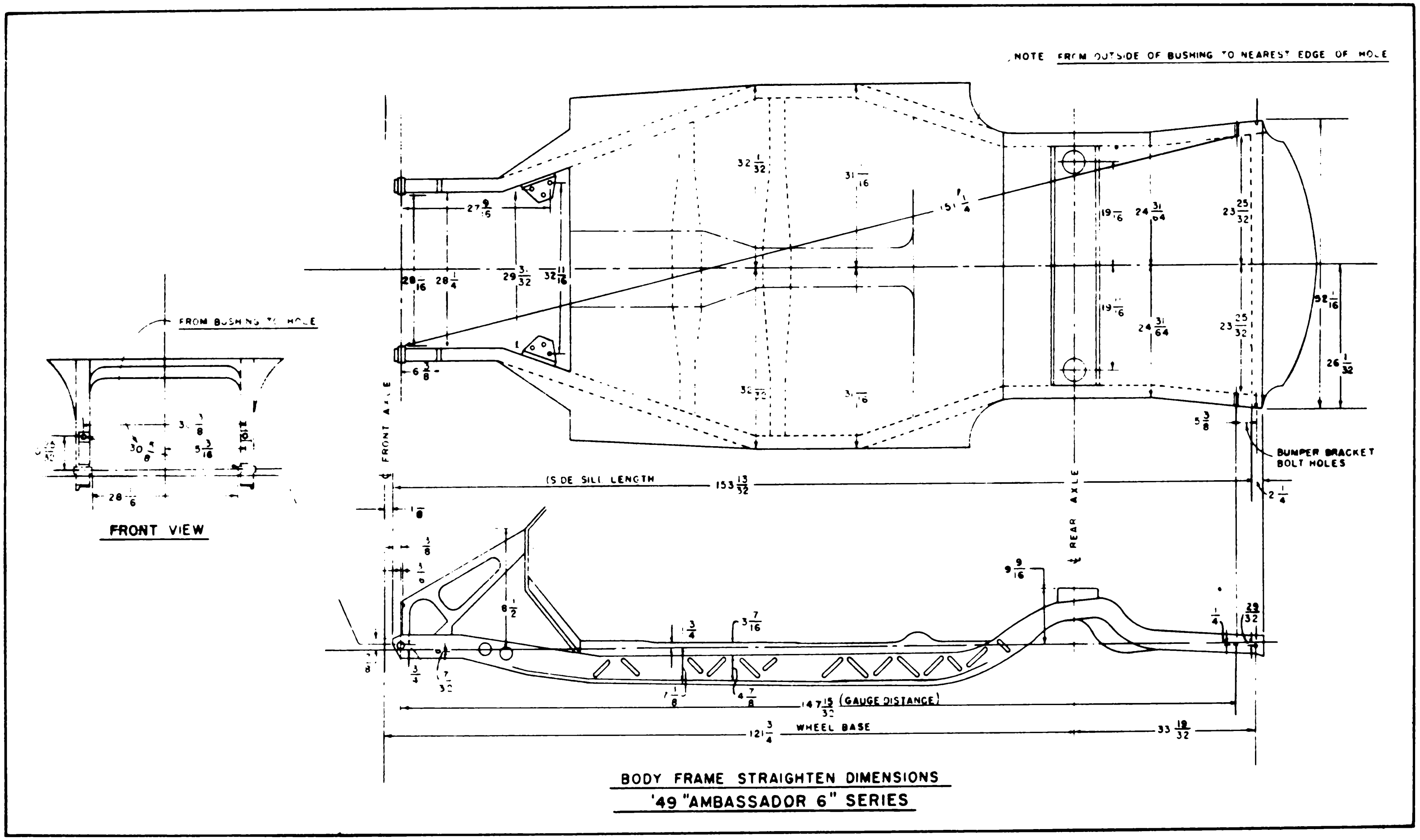
DOOR SEALER RUBBER

Subject No. 42

Keep rubbers clean and soft. Apply rubber softener and conditioner. See Subject 42.


NOTE FROM OUTSIDE OF BUSHING TO NEAREST EDGE OF HOLE
20 3/8
31 1/4
28 1/16
28 1/4
33 3/32
6 3/8
32 1/32
32 1/32
31 11/16
31 11/16
142 5/8
19 11/16
19 11/16
24 31/64
24 31/64
23 25/32
23 25/32
52 1/16
26 1/32
5 3/8
BUMPER BRACKET BOLT HOLES
2 1/4
℄ FRONT AXLE
SIDE SILL LENGTH 144 13/32
℄ REAR AXLE
1 3/8
1 1/8
3/16
1 7/8
18 1/2
3/4
7/32
1 3/4
3 7/16
7 1/8
4 7/8
9 9/16
1/4
29/32
138 15/32 (GAUGE DISTANCE)
112 3/4 WHEEL BASE
33 19/32
30 3/8
30 3/8
15 3/16
10 25/32
28 1/16
FRONT VIEW
BODY FRAME STRAIGHTEN DIMENSIONS
'49 "600" SERIES

Frame—Body Dimensions Chart—1949 "600" Series


NOTE FROM OUTSIDE OF BUSHING TO NEAREST EDGE OF HOLE
FROM BUSHING TO HOLE
FRONT VIEW
FRONT AXLE
REAR AXLE
SIDE SILL LENGTH 153 13/32
BUMPER BRACKET BOLT HOLES
147 15/32 (GAUGE DISTANCE)
121 3/4 WHEEL BASE
33 19/32
151 1/4
32 1/32
31 1/16
27 9/16
28 1/16
28 1/4
29 3/32
32 11/16
19 1/16
24 31/64
23 25/32
52 1/16
26 1/32
5 3/8
2 1/4
6 3/8
8 1/2
9 9/16
3 7/16
3/4
4 7/8
7 1/8
7/32
29/32
28 1/16
BODY FRAME STRAIGHTEN DIMENSIONS
'49 "AMBASSADOR 6" SERIES

Frame—Body Dimensions Chart—1949 "Ambassador 6" Series

BODY SECTION

SUBJECT NO.

Adjuster—Front Seat 74
Alignment—Door 38
Arm Rest—Front Door 17
Arm Rest—Rear Quarter 79
Back—Front Seat 75
Back—Rear Seat 76
Belt Moldings 44
Body Frame Dimensions Chart 1949 "600" Series 90
Body Frame Dimensions Chart 1949 "Ambassador 6" Series 91
Body Lubrication 89
Body Identification 1
Body Complete or Skeleton 3
Body Panels 4
Bending Doors 41
Car Identification Numbers 1
Channel Assembly—Front Door Center 25
Channel—Front Door Glass Side and Header 29
Channel—Rear Door Glass Side and Header 30
Chrome Plate Parts 86
Cleaning Upholstery 82
Cleaning Leather 83
Cleaning Rug Material 84
Clock Opening Cover 52
Cover—Rear Deck 5-66
Cover—Glove Box Door Clock Opening 52
Control—Remote 20-21
Cover—Rear Deck Ornament 64
Chart—Lubrication 89
Chart—Body Frame Dimensions 1949 "600" Series 90
Chart—Body Frame Dimensions 1949 "Ambassador 6" Series 91
Cowl Ventilator 69
Cushions—Seats 77
Deck Covers—Rear 5-66
Dome or Reading Light 71
Door Arm Rest 17
Door Alignment 38
Door Bending 41
Door Check—Front Doors 34
Door Check—Rear Doors 34
Doors 5
Door Finish Molding 14-55
Door Glove Box 54
Door Handle—Outside 12
Door Hinges 39
Door Hinge Springs 35-36
Door Key Lock 13-19
Door Lock—Front 22
Door Lock—Rear 23
Door—Locking 19
Door Lock Striker 40
Door Parts 6-7-8-9-10-11
Door—Remote Control Handle 15
Door—Remote Control Front Door 20
Door—Remote Control Rear Door 21
Door Sealer Rubber 42
Door Sill Mat 43
Door Trim Panel 43
Door—Ventilator Handle 16

SUBJECT NO.

Door Ventilator Assembly 24
Door Window Regulator Handle 15
Finish Molding—Door 14-55
Floor Unit Parts 4
Frame Unit Parts 4
Frame—Body Dimensions Chart 1949 "600" Series 90
Frame—Body Dimensions Chart 1949 "Ambassador 6" Series 91
Front Seat Frame—Sedans 72
Front Seat Frame—Brougham 73
Glass—Brougham Doors 27
Glass—Care—Handling 85
Glass—Front Doors 31
Glass—Rear Doors 32
Glass—Windshield and Rear Window 58-59
Glass—Rear Quarter Ventilator 33
Glass—Channel—Assembly—Front Door Center 25
Glass—Channel—Side and Header—Front Door 29
Glass—Channel—Side and Header—Rear Door 30
Glove Box Door 54
Glove Box Key Lock 51-54
Glove Box 50
Glove Box Door Clock Opening Cover 52
Glove Box Door Overlay 45-53
Handle—Door—Outside 12
Handle—Remote Control 15
Handle—Window Regulator 15
Handle—Door Ventilator 16
Handle—Deck Cover Key Lock 61
Headlining 80
Hinges—Door 80
Hinges—Rear Deck Cover 39
Hinge Springs—Door 34-35-36-37
Identification—Body 1
Inside Locking 19
Instrument Panel Overlays 45
Key Lock—Door 13-19
Key Lock Handle—Rear Deck Cover 61
Keys 19
Key Lock—Glove Box Door 51-54
Leather—Cleaning 83
Light—Dome or Reading 71
Locking—Doors—From Inside 19
Locking—Doors—From Outside 19
Lock—Glove Box Key 51
Lock—Front Door 22
Lock—Rear Doors 23
Lock—Rear Deck Cover 62
Lock Striker—Door 40
Lock Striker—Glove Box 54
Lock Striker—Rear Deck 63
Locking Doors 19
Lubrication—Body 89
Model Numbers 1
Moldings—Lower 44
Molding—Body Belt 44
Molding—Door Finish 14-55
Molding—Windshield Reveal—Stainless Steel 56
Molding—Rear Window Reveal—Stainless Steel 57
Molding—Stainless Steel—Care of 87
Numbers—Serial 1

ALPHABETICAL INDEX

SUBJECT	NO.
Numbers—Body	1
Ordering Parts	2
Ordering Paint	2
Ordering Trim Material	2
Ornament—Rear Deck Cover	64
Outside Door Handle	12
Overlays—Instrument Panel	45
Overlay—Finish Molding	55
Overlay—Rear Quarter Ventilator	55
Parts—Chrome Plated	86
Parts—Door Front	6-7-8
Parts—Door Rear	9-10-11
Parts—Ordering	2
Parts—Stainless Steel	87
Paint—Ordering	2
Paint Numbers	1
Panels—Body Metal	4
Panel—Door Trim	18
Panels—Floor and Frame Unit	4
Radio Overlay	45-48
Reading Light	71
Regulator Handle—Window	15
Regulator—Sedan, Front Door Window	26
Regulator—Brougham, Door	27
Regulator—Sedan, Rear Door Window	28
Remote Control—Front Door	20
Remote Control—Rear Door	21
Remote Control Handle	15
Roof Rail—Noise	81
Rubber Door Sealer	42
Rubber Sealer—Rear Deck Cover	67
Rug Material—Cleaning	84
Sealer Rubber—Door	42
Sealing Windshields and Rear Window	58-59
Seat Adjuster	74
Seat Back—Rear	76
Seat Back—Front	75
Seat Cushion	77
Seat Frame—Brougham	73
Seat Frame—Sedan, Front	72
Serial Numbers	1
Sill Mat	43
Skeleton Bodies	3
Springs—Seat Cushion	77
Springs—Seat Back	75-76
Stainless Steel Parts	87
Striker—Door Lock	40
Striker—Deck Cover Lock	63
Striker—Glove Box Door	54
Trim Numbers	1
Trim—Ordering	2
Trim Panel—Door	18
Trim Panel—Rear Quarter	79
Under Body Unit Parts	4
Unlocking Doors	19
Upholstery—Cleaning	82
Upholstery—Headlining	80
Upholstery—Front Seat Back	75
Upholstery—Latexfoam or Cotton Padded Cushions	62
Upholstery—Rear Seat Back	76
Upholstery—Replacing By Section	78
Ventilator Assembly—Front Door	24
Ventilator Assembly—Rear Quarter	33-55
Ventilator—Cowl	69
Ventilator Handle—Front Door	16
Water Leaks—Windshield	60
Water Leaks—Rear Window	60
Weatherstrip—Rear Deck Cover Rubber	67
Window—Rear Quarter Ventilator Assembly	33
Window Regulator—Front Door, Sedan	26
Window Regulator—Brougham	27
Window Regulator—Rear Door,Sedan	28
Window Regulator Handle	15
Windshield Wiper	70